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BRITISH MEDICAL JOURNAL

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THE HAZARDS OF PREGNANCY IN WOMEN WITH HEART DISEASE*

BY

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It is a terrible disappointment to a young woman to be told that, because she has a bad heart, it would be unwise for her ever to have children. Fortunately, in the great majority of cases, heart disease is no contraindication to pregnancy. The risk has in the past been grossly exaggerated, because writers on the subject have based their opinions on general impressions, which are notoriously fallacious.

In my clinic at the Manchester Royal Infirmary, during the last twenty-five years, my colleagues and I have followed through pregnancy, labour, and the puerperium more than 1,600 patients with organic heart disease. Many of these patients have been followed through more than one pregnancy, and others have been kept under observation for a year or more after delivery. Two samples from this group have been carefully analysed. In 1938 Edith Longson and I reported our findings in the first 350 cases (Bramwell and Longson, 1938), and an analysis of 500 of the more recent cases, studied by my colleagues Morgan Jones (1952) and Samuel Oleesky, has now been completed. It is interesting to compare these two series of cases and to see how our views regarding the management of this condition have changed during this period.

Assessment of the Risk

In attempting to assess the probable risk of pregnancy in patients with heart disease, it is convenient to classify cases in three groups :

I. In the first group are those patients in whom the heart disease is so trivial that it does not add appreciably to the risk of childbirth. Provided they are kept under medical supervision, these patients rarely cause any anxiety.

II. The second is the largest group. It consists of patients in whom the heart disease is such that it does add appreciably to the risk, but the risk is not regarded as prohibitive. The more severe cases in this group call for much discrimination and judgment on the part of the physician. Many factors other than the severity of the heart disease, such as the age of the patient, the facilities for antenatal and post-natal care, and the number of children in the family, must be taken into account in arriving at an assessment.

III. The third and smallest group consists of those patients in whom the risk is obviously so great that it would be unwise to sanction pregnancy, or if pregnancy is already established termination should be advised. Unfortunately some patients in this group are not seen until pregnancy is far advanced, and the risk of termination may then be greater than the risk of allowing pregnancy to continue. When termination of pregnancy is refused on religious grounds the decision is clearly no longer in the hands of the physician.

In assigning patients to their respective groups we have relied, in the first instance, on an estimate of the functional efficiency of the heart, based on the patient's exercise tolerance prior to pregnancy. I emphasize the words " prior to pregnancy," for as pregnancy proceeds the tolerance for exercise diminishes, and if a patient is not seen till late in pregnancy a false impression may be formed of her cardiac disability.

Roughly speaking, Group I consists of patients who had been able to undertake their household duties and other normal activities without breathlessness or other symptoms, while Group III consists of those who had experienced one or more episodes of congestive heart failure prior to pregnancy and also those in whom the rheumatic process appeared to be still active, or the cardiac condition showed evidence of rapidly progressive deterioration. Patients whose mobility had been limited to a greater or lesser extent, but who had not actually been in failure and whose heart disease appeared to be quiescent, are placed in Group II.

We must, however, consider not only the risk to the mother but also the prospect of a successful pregnancy which makes that risk worth taking. In our later series, four out of five pregnancies yielded living children, but of 53 patients with severe heart disease, who either refused termination or were first seen too late to terminate pregnancy, only one in four had a living child.

The Hazards of Pregnancy

(1) Congestive Heart Failure

Clearly the most important consideration in these patients is the risk of death from heart failure. There were 15 deaths from this cause in our earlier series, and these cases may be divided into two groups.

Four were women aged 39 or over (Table I), three of whom were in their seventh or later pregnancy, and three had established auricular fibrillation. In these four cases the patients' expectation of life was already very limited owing to the advanced state of the disease. Any additional strain, whether physical or due to intercurrent infection,

*A lecture to the Dundee Branch of the British Medical Association delivered on December 16, 1952.

TABLE I.—*Deaths from Heart Failure*

Age	Parity	Time after Confinement	Remarks
40	7	5 months	
43	7	3 ,,	A.F. A.C.
39	14	2 ,,	A.F. A.C.
39	5	3 weeks	A.F. A.C.

A.F.=Auricular fibrillation. A.C.=Attended antenatal clinic.

might have proved fatal. In their case the strain happened to be pregnancy. They were, in fact, all cases in which we should regard pregnancy as contraindicated, and would have advised termination had they been seen earlier in pregnancy.

The other 11 cases (Table II) were of quite a different type. They were younger women, seven of them primigravidae, their heart disease was less advanced, and all but

TABLE II.—*Deaths from Heart Failure*

Age	Parity	Time After Confinement	Remarks
29	1	Undelivered	
25	1	Same day	
27	3	1 day	
32	2	3 days	A.F.
30	1	3 ,,	A.F. A.C.
24	1	3 ,,	
27	2	6 ,,	
33	1	4 weeks	
36	2	5 ,,	
25	1	6 ,,	
24	1	9 ,,	

two had normal rhythm. There was another common factor in this group—only one of these patients had attended the antenatal clinic, the other 10 had been admitted to hospital in the later months of pregnancy as "urgencies" on account of heart failure. This we regard as most significant, for it is our experience that, in women who are pregnant, congestive heart failure, if recognized early, responds well to treatment, and it is only when the condition is allowed to run on unchecked that it becomes irreversible. Adequate antenatal supervision is, we believe, the most important single measure in limiting the risk to which these patients are subject.

Intercurrent complications, especially bronchial infection and anaemia, are apt to precipitate heart failure in patients with rheumatic heart disease. Bronchitis, influenza, and even the common cold must be treated with great respect in these patients. In foggy weather they should be confined to the house, crowds and places of public entertainment should be avoided, and in the event of infection they should be put to bed and kept there until they are fully convalescent. In our experience anaemia is often overlooked. This is particularly unfortunate, since adequate treatment of the anaemia will usually relieve the heart failure.

The common sequence of events in the later stages of mitral stenosis is the development of auricular fibrillation followed by congestive heart failure. The onset of heart failure is usually insidious, with gradually increasing oedema of the dependent parts of the body, enlargement of the liver, and engorgement in the veins of the neck. These signs are easily recognized. A few weeks' treatment in hospital will generally suffice to restore the normal balance, and the cardiac function may be satisfactorily controlled throughout the remainder of pregnancy, provided the patient is kept under supervision. If this were the only danger we had to face, assessment of the risk would be easy, but occasionally things take quite a different course.

(2) Acute Pulmonary Oedema

When congestion affects the pulmonary instead of the systemic circuit, heart failure manifests itself by paroxysmal dyspnoea (cardiac asthma) and acute pulmonary oedema. The suddenness with which these symptoms may develop contrasts strikingly with the more insidious onset of congestive heart failure in the systemic circuit. They constitute a grave emergency, which may prove rapidly fatal. In our later series, 7 of the 11 deaths from heart failure which occurred during pregnancy or within eight months thereafter were due to this cause, a very heavy mortality considering that only 16 patients in the whole series developed acute pulmonary oedema.

Acute pulmonary oedema used to be regarded as a rare complication of mitral stenosis, and its greater frequency in association with pregnancy was attributed to the increased blood volume and the increased retention of salt and water in the body. The successful surgical treatment of mitral stenosis, however, has led to a more intensive study of this valvular lesion and has shown that acute pulmonary oedema is not nearly such a rare complication as we used to believe. It is, in fact, one of the most urgent indications for mitral valvotomy.

In the earlier years of investigation we did not fully appreciate the importance of acute pulmonary oedema, and regarded it merely as a type of heart failure. In 1941, however, our attention was urgently directed to the matter by two cases under my care, both of which proved fatal. The post-mortem findings in these two patients (reported by Bramwell and Jones, 1944) were illuminating. During life both had normal rhythm with a very loud crescendo presystolic murmur, and at necropsy were found to have a buttonhole mitral stenosis with great hypertrophy of the wall of the left auricle. This combination suggested that the rheumatic process had hit the valve hard, but spared the muscle. In spite of the extreme degree of stenosis the hypertrophied auricle had for many years been able to maintain ventricular filling, when suddenly, under the strain of pregnancy, it failed, the lungs were flushed with blood, and pulmonary oedema developed, rapidly proving fatal.

It is in cases such as these, with normal rhythm and a loud presystolic murmur, that pulmonary oedema is most likely to develop. Whereas in children the murmur of mitral stenosis is generally heard in mid-diastole, in older patients the most striking feature is the crescendo murmur in presystole. This difference can be accounted for by the fact that in young subjects the blood flow from auricle to ventricle is most rapid when the mitral valve first opens, whereas in older people the auricle, having had time to hypertrophy, expels its contents much more forcibly, and consequently the rate of blood flow through the mitral orifice attains its maximum during auricular systole. In patients with a loud crescendo presystolic murmur during life, an extreme degree of narrowing of the mitral orifice is often found at necropsy, the high degree of mitral obstruction having called forth a compensatory work-hypertrophy in the auricle, which manifests itself clinically by a loud crescendo presystolic murmur. Such hypertrophy occurs only when the heart muscle is healthy; a damaged auricle, when subjected to strain, fibrillates.

The grave nature of acute pulmonary oedema makes it vitally important to be on the look-out for any signs which give warning that it may develop, for if these are manifest during the early months of pregnancy therapeutic abortion is indicated. Unfortunately, acute pulmonary oedema usually first makes its appearance in mid-pregnancy, by which time emptying the uterus has become a much more serious matter on account of the dangers of embolism, shock, and haemorrhage. An isolated attack of acute pulmonary oedema should always be regarded as a warning that further trouble of a similar nature must be expected in the future. Although systemic and pulmonary congestion often occur together, pulmonary congestion may lead to fatal acute pulmonary oedema before any systemic oedema or other signs of right heart failure are evident, and it is then that it is most likely to take us by surprise.

The importance of the early recognition of pulmonary congestion cannot be over-emphasized. Its clinical manifestations are paroxysmal dyspnoea and repeated haemoptysis; later, persistent moist rales appear at the lung bases. A rapid increase in weight during mid-pregnancy should lead one to suspect excessive water retention in the body. There is a progressive diminution in vital capacity, but the most

convincing evidence is derived from radioscopic examination of the chest, which yields direct visual proof of the congested state of the lungs. In any clinic devoted to heart disease in pregnancy, facilities for *x*-ray screening are an absolute essential. The electrocardiogram, on the other hand, gives us little help in these cases.

Before the introduction of mitral valvotomy we used to advise termination of pregnancy in all such cases, but within the last few months Baker, Brock, Campbell, and Wood (1952), in London, and Logan and Turner (1952), in Edinburgh, have reported cases in which valvotomy has been successfully performed during pregnancy, and the pregnancy allowed to proceed to a normal termination. In patients with pulmonary congestion, valvotomy should be undertaken before they become pregnant.

Brock also suggests, on theoretical grounds, that patients with coarctation of the aorta who are pregnant should be submitted to operation. With this suggestion I cannot agree. This is a very serious operation which carries a high mortality, and the only risk these patients run is rupture of the aorta at the time of delivery, a risk which can be avoided by caesarean section.

(3) Auricular Fibrillation

This is a common precursor of heart failure. It is a milestone well down the road of rheumatic heart disease and a warning that heart failure is not far ahead. As such, it merits especially careful consideration in assessing the risk of pregnancy.

In the early days of this investigation we were unduly afraid of this complication, having been impressed by the high mortality reported by some earlier workers (Table III).

TABLE III.—*Auricular Fibrillation*

	Cases	Deaths
Carr and Hamilton (1933) ..	14	6
Robinson (1927)	18	13
Hunt (1926)	22	8

Further experience, however, has led us to believe that under favourable circumstances it is not incompatible with successful pregnancy.

In our earlier series of cases, 24 patients developed auricular fibrillation either before or within six months of delivery. Of these, seven died. This is a heavy mortality, but careful scrutiny (Table IV) of our fatal cases suggests that the picture is not quite so gloomy as it appears at first sight.

TABLE IV.—*Fibrillators who Died*

Fibrillation Developed	Parity	Age	Remarks
Before pregnancy	14	39	
	1	35	Cerebral embolism. C.S.
	1	30	
	2	32	"Urgency"
During pregnancy ..	1	26	Induced 36 weeks. "Urgency"
After delivery ..	7	43	
	5	39	

C.S.=Caesarean section.

In three cases pregnancy was clearly contraindicated, and termination would have been advised had they come under observation earlier in pregnancy. Two were women who developed fibrillation after delivery in their fifth and seventh pregnancies respectively. They were aged 39 and 43. In both of these patients the strain of labour undoubtedly precipitated a final breakdown in a heart which was nearing the end of its tether in the normal course of the disease. The third was a woman of 39 in her fourteenth pregnancy who had fibrillation when first seen. Of the remaining four fatal cases in this group, two died of intercurrent postoperative complications and one other had not received adequate antenatal care. Thus it is conceivable that under the most favourable circumstances we might have lost only one of these seven patients.

These considerations led us to modify our previous opinion and to believe that, although auricular fibrillation does undoubtedly add to the risk of pregnancy, it does not constitute a bar to pregnancy, provided the patient can be kept under observation and receive adequate treatment. In our later series 19 patients had auricular fibrillation, and only two died.

(4) Other Considerations

In patients in Group II, who have never actually been in failure but whose tolerance for exercise is limited to a greater or lesser extent, the strain on the heart adds in varying degree to the risk of pregnancy. Those in whom there is considerable limitation of activity are the most difficult to assess, and various factors other than the severity of the heart disease must be taken into account in framing the prognosis.

Clearly a previous trouble-free pregnancy affords the surest ground for optimism, provided the patient's cardiac condition has not deteriorated since her last confinement. The first pregnancy eliminates most of those likely to succumb. Women under 35 are better risks than those over that age. Consequently the risk is smallest in young women who have already had one or more children.

Some workers have attached more weight than others to the size of the heart in assessing the risk of pregnancy. Our own experience leads us to believe that it is much less important than the functional efficiency of the heart as estimated by the exercise tolerance, and in this connexion it is especially significant that many patients who develop acute pulmonary oedema have but little cardiac enlargement.

When we embarked on this investigation we expected to find that patients whose only valvular lesion was mitral stenosis would do better than those who had both a mitral and an aortic lesion. This forecast has not proved to be correct. Whereas, in our earlier series, amongst 260 patients with uncomplicated mitral stenosis there were 20 deaths (8%), there was only one death (3%) amongst the 31 patients with both mitral stenosis and a lesion of the aortic valve. Our experience is similar to that of most other workers in this country.

Aetiology

Let me refer very briefly to the question of aetiology. About 90% of cases of heart disease in pregnant women are rheumatic, and most of the remaining 10% congenital.

In rheumatic heart disease the orthodox teaching was that the more attacks of rheumatic fever or chorea from which a patient had suffered, the more severe was the heart lesion likely to be. This seemed a reasonable assumption, since each attack was likely to add to the previous damage. It therefore came as somewhat of a surprise to us to find that the mortality was highest in those cases in which there was no history of rheumatic infection, and in which heart disease, previously unsuspected, had been discovered either at a routine medical examination or when the doctor had been called in to attend the patient for some minor ailment.

Out of 293 cases of mitral stenosis, admittedly a rheumatic lesion (Table V), 173 gave a history of rheumatic fever or chorea, and, of these, nine died before or within six months

TABLE V.—*Mortality in Patients with Mitral Stenosis*

History	No. of Cases	No. of Deaths
Rheumatic fever or chorea ..	173	9 (5%)
No previous illness	32	9 (28%)

of confinement. Of the remaining 120, 88 dated their symptoms from an attack of muscular rheumatism, tonsillitis, or some other acute infection, while in 32 there was no history of any antecedent disease, their first manifestation of ill-health having been cardiac. Of these 32, 9 died before or within six months of confinement. Thus the mortality in patients with a rheumatic history was 5%,

whereas the percentage of those with no previous history of illness was 28%. I think the explanation of this is that children with acute articular rheumatism or chorea are put to bed and kept there to prevent cardiac damage, whereas in those whose joint and nervous manifestations are minimal the true nature of the illness is apt to be overlooked, and consequently no such precautions are taken.

There were 19 cases of congenital heart disease in our earlier series, and in 13 of these the lesion was of a relatively trivial nature. The only patient who died was a 3-para of 27 with cyanotic heart disease and great cardiac enlargement, first seen at the eighth month of pregnancy.

Subacute bacterial endocarditis is an important complication of pregnancy. In 1946–7 my department participated in the investigation, planned by the Medical Research Council, on the treatment of this condition with penicillin (Bramwell, 1948). Of the first 33 cases in our series 22 were women, 7 of whom were pregnant. Of these seven, two were moribund when first seen, the true nature of the condition having escaped recognition, and the infection having been present for many weeks before treatment was started. Both these patients died, but their babies survived. The other five patients came under our care much earlier in the course of the disease and all survived, the infection having been satisfactorily controlled. In these seven cases we lost only one child—a macerated foetus.

Unexplained fever in any patient with valvular or congenital heart disease who is pregnant calls for immediate blood culture, since the duration of infection is one of the most important considerations in prognosis in subacute bacterial endocarditis.

Remote Prognosis

Now what about the ultimate prognosis in these patients? Most earlier workers believed that pregnancy always produced a permanent aggravation of the cardiac disability. We now know that is not true. As patients grow older the disability resulting from rheumatic heart disease tends to increase, and if deterioration is observed it is often difficult to say whether this is attributable to pregnancy or merely to the normal course of the disease.

Gilchrist and Murray-Lyon (1933) made some interesting observations on this point. They studied the age at death in 109 cases of mitral stenosis that came to necropsy, in all of which death was directly attributable to heart disease. Forty of these cases were males and 69 were females—28 nulliparous and 41 parous. The average age at death was 39.3, 42.1, and 42.0 respectively. I think we can hardly blame pregnancy for the earlier death in the male group, though Mr. Punch, in one of his most famous cartoons, did suggest that childbirth was a great strain on the father! In the case of the females there is no appreciable difference between the parous and nulliparous women as regards the average age of death, but one must take into consideration the fact that only the fitter women marry, and, of those who do marry, the fitter are more likely to have children.

In these three groups there was little difference in the number of survivors at different ages, and had pregnancy exerted a detrimental influence one would have expected a higher mortality amongst the parous women during the child-bearing period.

Our own observations have convinced us that, in young patients at any rate, pregnancy is rarely detrimental. Morgan Jones followed up his cases after delivery until the cardiac condition had either shown deterioration or been stabilized at its previous level. Twenty-five patients died, and it was found that, of the 475 who survived, 427 (90%) showed no obvious deterioration as the result of pregnancy.

Treatment

If I were asked what I regarded as the most important consideration in the treatment of patients with heart disease who were pregnant, I should have no hesitation in saying that it is never, under any circumstances, to interfere with pregnancy in a patient with heart failure until all has been done that can be done—and that is often a great deal—to relieve the heart failure. When a woman is admitted to hospital as an "urgency," desperately ill with a failing heart, it is tempting to think that, to save life, the termination of pregnancy is indicated. It is not. In these circumstances surgical intervention is an unjustifiable risk. It is surprising how well many of these patients respond to treatment. A few days' rest in bed, with skilled nursing, digitalis, and sedatives, will often convert what was a hopeless case into a reasonable surgical risk. When the heart condition has been stabilized, and not before, is the time to consider whether pregnancy should be terminated.

In such cases, when the heart failure had been relieved, we used to recommend caesarean section; but further experience has convinced us that normal delivery carries less risk, and, with the single exception of coarctation of the aorta, in which condition there is danger of rupture of the aorta at the time of labour, we always advise that, in the absence of obstetric indications, pregnancy should be allowed to pursue its normal course. Workers in other centres have come to the same conclusion (Haigh and Gilchrist, 1949).

The more we have studied this problem the more reluctant have we become to interfere with pregnancy. This change in policy is, we believe, partly responsible for the improvement in our results, seven deaths in our earlier series having been due to post-operative complications following termination of pregnancy.

When we first embarked on this investigation it was generally thought that the strain on the heart increased progressively as pregnancy advanced, and on this account the induction of premature labour (or caesarean section) before full term was often advised in women with heart disease to avoid the strain of the final month of pregnancy. We now know that the blood volume and cardiac output do not increase, but actually diminish, during the last few weeks of pregnancy. These facts have led us to modify our views regarding the management of such cases. There is little danger of heart failure developing during the last month of pregnancy if it had not been present previously, and there is therefore no purely cardiac indication for terminating pregnancy at this stage, since the strain on the heart will not be increasing but diminishing. Admittedly the presence of a cardiac lesion would justify operative intervention in those borderline cases in which there is some obstetric complication that by itself alone might not have done so.

Finally, let me remind you once again of the importance of adequate antenatal supervision. When Edith Longson and I came to analyse the first 350 cases in our series we found that 325 had attended the antenatal clinic and only 25 had been admitted as "urgencies." Fourteen of the urgencies and 11 of the quiet cases proved fatal, so that the death rate among urgencies was 56%, as compared with 3% among quiet cases.

Similar results had been reported elsewhere (Table VI).

TABLE VI.—*"Urgency" Death Rate*

	No. of Cases	Total Deaths	"Urgency" Deaths
Bramwell and Longson (Manchester)	350	25	14 (56%)
Carr and Hamilton (Boston)	500	32	16 (50%)
B. P. Watson (1933) (New York)	240	17	8 (47%)

But we can go a step further, for in 10 of our 25 fatal cases death was due not to heart failure but to other causes. In the 15 patients who died of heart failure the figures are even more striking. Of these, 11 were urgencies and only 4 quiet cases. Thus the death rate from heart failure in our quiet cases was 1% as compared with 44% amongst urgencies. These figures convinced us of the importance of adequate antenatal supervision.

In our pregnancy cardiac clinic at the Manchester Royal Infirmary the almoner plays an important part. Her experience enables her to resolve many of the patients' difficulties and to arrange home help, to tide over the emergency, in case of need. From the psychological aspect, also, we believe this special clinic has proved useful. The newcomers get talking with the old hands, who have been through the mill before, and begin to realize that heart disease is not nearly such a terrible thing as they had been led to believe.

James Mackenzie

I cannot conclude my lecture without reference to the work of a very remarkable man—a man who was keenly interested in this problem and who wrote a book on heart disease in pregnancy (Mackenzie, 1921). He must have been a familiar figure to the older members of my audience, for he spent the Indian summer of his life in St. Andrews.

James Mackenzie was a Highlander. He was educated at Perth Academy and Edinburgh University. The next twenty-five years—the most productive years of his life—were devoted to general practice in Burnley. His work there is commemorated by a tablet on the wall of the house in which he practised. During the war this tablet was removed, for the powers that be considered that the word "Burnley," which appeared in the inscription, might prove helpful to the enemy in the event of invasion.

As an undergraduate Mackenzie won no special academic distinction. Later, however, he proved himself to be an investigator of outstanding merit and a man who made the fullest possible use of his opportunities. Mackenzie will probably go down to history as the man who solved the riddle of the cardiac irregularities. This he did by means of his clinical polygraph; all the earlier models of this instrument were made for him by Mr. Shaw, a local watchmaker.

But far more important was his work on prognosis, based on his own clinical observations. I have never ceased to marvel that such a popular and busy family doctor could find the time, and have the energy, to keep such wonderful records of his cases. The hours for research were literally snatched from the rush of general practice. It was these records of his cases in Burnley which enabled Mackenzie finally to overthrow the dictatorship of the stethoscope, which had dominated cardiology for nearly a hundred years.

Summary

The chief dangers to be faced in patients with heart disease who are pregnant are acute pulmonary oedema and congestive heart failure. The former calls for special vigilance on account of the suddenness with which it may develop, and in every case of mitral stenosis clinical or radiological evidence of pulmonary congestion must be regarded with grave apprehension. Congestive heart failure with oedema, if recognized early, usually responds well to treatment.

Auricular fibrillation, though a recognized precursor of heart failure, is not necessarily a bar to pregnancy, provided adequate antenatal and post-natal care can be assured. In assessing the risk, the previous obstetric history, age, economic conditions, and temperament of the patient must all be taken into account.

In patients with heart failure, surgical intervention should never be contemplated until the heart failure has been treated. Patients with heart disease tolerate pelvic delivery better than caesarean section.

In patients with advanced heart disease pregnancy is contraindicated. If, however, pregnancy is already established and the patient is seen within the first three months, it should be terminated, but, if she is not seen until later, it should be allowed to run its normal course. Alternatively, mitral valvotomy may be considered.

There is no purely cardiac indication for anticipating normal delivery.

All patients, however trivial their heart disease, should be kept under observation throughout pregnancy, and intercurrent infection and anaemia promptly treated.

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TREATMENT OF GENITO-URINARY TUBERCULOSIS

FURTHER REPORT

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In 1951 we published a preliminary report on the treatment of 51 cases of genito-urinary tuberculosis (Ross *et al.*, 1951). The present communication includes a record of a further 47 patients similarly treated, and a follow-up of the earlier series. It is necessary to emphasize once more that a long-term view must be taken of this disease, as it is possible to encounter patients who have survived for many years after a bilateral renal lesion has been confirmed and in spite of the absence of treatment of any kind.

Classification.—No patient was accepted for treatment until a positive guinea-pig inoculation test put the diagnosis beyond all reasonable doubt. At the same time no case, however serious, was refused treatment. The patients were divided in five groups: (1) minor unilateral lesion or subclinical focus; (2) lesion of one kidney with cystitis and nephrectomy; (3) bilateral disease and nephrectomy of the worse kidney; (4) infection of the remaining kidney; and (5) severe bilateral disease. We realize that this is not a perfect classification, but for the purpose of uniformity in assessing the results we have not altered it on this occasion.

Method of Treatment

In addition to the regime described below, the ordinary surgical measures, such as nephrectomy and epididymectomy, were carried out when required, with the proviso that the optimum time was selected for the operation. For example, nephrectomy was often performed during the second or third course of streptomycin.

The whole course of treatment lasted six months, during which time the patient received the usual sanatorium regime at Wrightington Hospital. The three drugs used were: (*a*) "Ethizone" (*para*-ethylsulphonylbenzaldehyde thiosemicarbazone, or T.B.3), beginning at 50 mg. daily and gradually increasing by weekly increments of 200 mg. daily. Ethizone was given continuously for the six-months course of treat-

ment. (*b*) *Para*-aminosalicylic acid (P.A.S.), 18 g. daily, given at three-hourly intervals for periods of 25 days, alternating with (*c*) dihydrostreptomycin, 1 g. twice a day for a period of 35 days. A mixture containing 30 gr. (2 g.) of potassium citrate and 5 gr. (0.32 g.) of potassium iodide was given thrice daily throughout the streptomycin periods.

Originally it was a difficult matter to render and maintain the urine alkaline, but as a result of recent extended tests we have found the following mixture both palatable and effective:

Potassium citrate	30 gr. (2 g.)
Sodium citrate	30 gr. (2 g.)
Potassium acetate	20 gr. (1.3 g.)
Syrup of lemon	7½ min. (0.45 ml.)
Extract of liquorice	7 min. (0.42 ml.)
Aqua	ad ½ oz. (14 ml.)

½ oz. (14 ml.) four times a day

We have already given our reasons for this method of treatment (Ross *et al.*, 1951), which has been gradually evolved as a result of experience. Briefly these reasons are:

(1) Each of the three drugs probably exerts a different effect on the tubercle bacillus, and it seems logical to use all three in the hope of achieving the maximum effect.

(2) Lattimer *et al.* (1950) have shown that in order to maintain an adequate concentration of streptomycin in the blood it is desirable to give 1 g. every twelve hours. The concentration in the blood following intramuscular injection of 1 g. of streptomycin is as follows:

1 hour	14–31 u./ml.	6 hours ..	8–15 u./ml.
2 hours	22–38 ,,	7 ,, ...	6–10 ,,
3 ,, ...	18–22 ,,	10 ,, ...	5–9 ,,
4 ,, ...	14–18 ,,	12 ,, ...	3·4–5 ,,
5 ,, ...	10–13 ,,		

(3) Lattimer *et al.* also pointed out that the incidence of toxicity rapidly increased after 60 days and was invariably present at 120 days, using 2 g. of streptomycin daily. We have therefore adopted the intermittent method of administering streptomycin to counteract this tendency.

(4) By using the alternating technique we hoped not only to prevent the emergence of resistant strains of tubercle bacilli, but also to diminish the intolerance of patients to the larger doses of P.A.S.

(5) Ethizone was given continuously, as it has been shown by Domagk *et al.* (1946) that the best results were obtained after prolonged administration. Ethizone seems to be the most active and least toxic of the thiosemicarbazones (Hoggarth *et al.*, 1949; Hoggarth and Martin, 1950). There is evidence to show by the "corneal screening" test that the effects of both P.A.S. and streptomycin are enhanced by ethizone (Rees and Robson, 1950, 1951).

Surgical Measures

During the course of treatment nephrectomy was performed on 13 patients, the ureter being excised only as far as the pelvic brim. The wound was invariably closed without drainage, and in every case healed by first intention. With the introduction of antibiotics it would seem that partial or polar nephrectomy may prove of value. Partial nephrectomy has not been carried out in the present series, but has been performed on several occasions in the third group of cases, to be published at a later date.

Epididymectomy was found to be necessary in 12 patients, and was carried out by the Ross (1948) technique. Healing was satisfactory, and in no instance did atrophy of the testicular body occur.

Three patients required transplantation of the ureter of the remaining kidney into the colon. All three were advanced cases (type 4), and two patients died some months after the operation. The third patient has remained well. We believe that the two deaths were due to acidosis and uraemia, and hope to eliminate these tragedies in future by maintaining a close watch on the blood chemistry for a prolonged period. As routine measures we insist on a low-salt diet, a strong alkaline mixture, and three-hourly evacuation of the bowels day and night.

Toxicity

In view of the fact that potent drugs were being used over an extended period of six months it seemed important that signs of toxicity should be recognized and dealt with at the earliest possible moment.

P.A.S.—This has been extensively employed in the treatment of all forms of tuberculosis, and many workers experienced in its use have testified to its low toxicity (Nagley, 1949; McAnally and Seymour, 1948). In spite of this we have found some minor toxic symptoms in 35% of our patients, especially nausea, vomiting, anorexia, and mental depression. In a further 25% the drug had to be discontinued because of severe vomiting, despite the fact that all varieties and forms, such as the calcium salt, cachets, and enteric-coated granules, were given a trial. We have not encountered haematuria or albuminuria (Nagley and Logg, 1949), nor have we seen any skin eruptions. Two patients developed toxic hepatitis (Gow, 1951) similar to those previously reported (Cuthbert, 1950; McKendrick, 1951). There was no clinical evidence of potassium depletion (Heard *et al.*, 1950; Cayley, 1950) in this series. Thus it can be seen that until a less toxic form of P.A.S. is available the full value of the drug cannot be achieved in an appreciable number of patients. For this reason we are now using the calcium salt of B.P.A.S. (N-benzoyl *para*-aminosalicylic acid) (Gow, 1953).

Dihydrostreptomycin.—In spite of using the intermittent method of administration outlined above, we have encountered an appreciable number of toxic manifestations. In the present series of 47 patients deafness has occurred in six, dizziness in eight, and both symptoms in two. Skin rashes were found in three cases. The dizziness and skin rashes were transient and disappeared quickly when the drug was stopped. Desensitization was often effective, and was carried out by beginning with a daily injection of 0.1 g. of streptomycin, gradually increasing up to 1 g., the course lasting a fortnight. The administration of "avomine," one of the antihistaminic drugs, was also helpful. Deafness was a more serious symptom, and appears to be permanent. These figures correspond with those quoted from a smaller series (Cathie and Garrow, 1951; Don and Gregory, 1952; etc.). It would seem that the percentage of patients becoming deaf with dihydrostreptomycin is much higher than with streptomycin sulphate, although the activity of the two preparations is the same. In future, therefore, we intend to use the latter.

Ethizone.—We have not seen any of the more severe complications described, such as liver or renal damage, but as a precautionary measure we have carried out at regular intervals the thymol turbidity test on patients' sera. All findings were below 4 units, which, at the very least, indicates that there has been no gross liver damage. In a few instances, in which toxaemia from the *disease* was severe, there has been a progressive anaemia, which improved, irrespective of the ethizone, when the tuberculous focus producing the toxaemia was removed. In no case was the ethizone stopped. All patients were able to tolerate 150 mg. daily, but 30% were not able to take 200 mg. for prolonged periods. Intolerance of the higher dose was manifested by anorexia, depression, and mental apathy. Patients under treatment with thiosemicarbazone, and ethizone in particular, should abstain from alcohol on account of its reaction. The symptoms of this are palpitation, flushing of the skin, and a full bounding pulse. If the effect is severe, collapse may occur. These symptoms may last two to three hours. They can also be experienced in a minor degree for about seven to ten days after the ethizone has been discontinued.

Results

As in our previous communication, we have attempted to assess the results in the following way: (*a*) sterilization of the urine; (*b*) radiographic changes; (*c*) cystoscopic improvement, including an increase in bladder capacity and

an improvement in the appearance of the mucous membrane or ureters; and (*d*) clinical improvement—for example, frequency of micturition, dysuria, gain in weight.

(a) Sterilization of the Urine

We have always believed that the sterilization of the urine is the absolute criterion of the efficacy of any particular method of treatment. We have therefore taken special care to ensure that the technique employed should eliminate as many sources of error as possible.

During the period of treatment the urines were investigated for the presence of tubercle bacilli at approximately six-weekly intervals. Every effort was made to isolate the bacillus, and the methods used for this were modified from time to time in order to improve the results.

In the early stages of the investigation the six-weekly search for tubercle bacilli was carried out on the total quantity of urine passed by the patient over a period of 40 hours. The collection of this urine was carried out as follows: (*a*) A 24-hour pooled specimen. (*b*) The "first morning" specimen passed by the patient after the end of the 24-hour period. (*c*) A catheter specimen obtained from the patient four to five hours after the first morning specimen had been passed.

The 24-hour specimens were allowed to stand for 48 hours, and 150 ml. of the deposit was removed and centrifuged. The centrifuged deposit was treated for a minimum time with 3% sodium hydroxide to destroy contaminating organisms. After neutralization it was inoculated on two Löwenstein–Jensen slopes and, except in some of the earlier cases, into two guinea-pigs.

From the first morning specimen 100 ml. was centrifuged and the deposit, after treatment with 3% sodium hydroxide, was inoculated on two Löwenstein–Jensen slopes.

The catheter specimens were used in an effort to overcome the possibility that the sodium hydroxide needed to destroy contaminating organisms might reduce the number of positive results by its lethal action on the tubercle bacilli. Each specimen was collected with the utmost aseptic precautions, using a no-touch technique. The whole specimen was centrifuged and a small part of the deposit inoculated on to a blood-agar plate. If no growth appeared on overnight culture the specimen was regarded as free of contaminants and inoculated without further treatment on two Löwenstein–Jensen slopes. If contaminating organisms grew on the blood-agar plate the deposit was treated with sodium hydroxide before inoculation.

Thus each investigation entailed the inoculation of six Löwenstein–Jensen slopes and two guinea-pigs. The results obtained from these specimens are given in Table I. These

TABLE I

Type of Specimen	No. of Specimens	Positive	
		No.	% (Approx.)
24-hour: culture	99	8	8
,, ,, guinea-pig	48	13	27
First morning: culture	97	7	7
Catheter, no contaminants (no sodium hydroxide used)	39	1	2·5
Catheter, contaminated (treated with sodium hydroxide)	47	1	2

results revealed a number of facts: (*a*) That early morning specimens were giving results equally as good as those obtained from the 24-hour specimens. (*b*) That, in spite of the greatest possible care, more than half the catheter specimens were bacteriologically contaminated. (*c*) That the results of culture of catheter specimens compared unfavourably with those obtained from early morning and 24-hour specimens. This applied whether the catheter specimens were treated or untreated with sodium hydroxide. (*d*) That guinea-pig inoculation of the deposits was giving better results than cultural methods.

For these reasons both the methods of collecting specimens and their examination were changed. The specimens were limited to 24-hour pooled urines and first morning specimens.

The 24-hour specimens were allowed to stand for 48 hours. At the end of this period the whole of the thick deposit ("sludge") was withdrawn. An equal volume of the urine lying immediately above it (supernatant) was also withdrawn into a separate container. These two specimens, each about 50–100 ml. in volume, were centrifuged, and the deposits treated with sodium hydroxide and neutralized. The resultant mixtures were divided into two. One-half of each was inoculated on two Löwenstein–Jensen slopes. The other half of one of them was inoculated into two guinea-pigs.

The first morning urine was treated in the same manner as in the early cases, except that the deposit was inoculated on two Löwenstein–Jensen slopes and also into two guinea-pigs. By this means, on each six-weekly investigation the deposits from 36 hours' urine were inoculated on six Löwenstein–Jensen slopes and into four guinea-pigs. The results are given in Table II.

TABLE II

Specimen	No.	Positive	
		No.	% (Approx.)
Early morning: culture	102	6	6
,, ,, guinea-pig	102	18	18
24-hour "sludge": culture	108	5	4·5
,, ,, guinea-pig	62	7	11
"Supernatant": culture	99	7	7
,, guinea-pig	47	4	8·5

Examination of results at this stage led us to draw certain inferences: (*a*) That once again the results from the early morning specimens were at least as good as those from the 24-hour pooled specimens. (*b*) That guinea-pig inoculation was still giving better results that cultural methods. (*c*) That the distribution of tubercle bacilli in the "sludge" and the urine layer immediately above it was more or less uniform. (*d*) That the use of smaller volumes of deposit from the 24-hour specimens was apparently leading to somewhat poorer results.

A further change was therefore made in the technique. The 24-hour specimens were allowed to stand for 48 hours and a minimum of 200–300 ml. was centrifuged, the resultant deposit being treated with sodium hydroxide and inoculated on two Löwenstein–Jensen slopes and into two guinea-pigs. The whole of the early morning specimens were centrifuged and the deposit was inoculated on two Löwenstein–Jensen slopes and into two guinea-pigs. The results obtained by this method are given in Table III.

By this means we obtained the greatest proportion of positive results both in the early morning specimens and in the 24-hour specimens. Once again guinea-pig inoculation

TABLE III

Specimen	No.	Positive	
		No.	%
Early morning: culture	93	12	13
,, ,, guinea-pig	93	26	28
24-hour: culture	135	13	8
,, guinea-pig	135	42	31

TABLE IV

Specimen	No.	Positive	
		No.	%
Early morning: culture	292	26	8·9
,, ,, guinea-pig	193	46	24
24-hour: culture	441	22	5
,, guinea-pig	284	68	24

gave better results than artificial culture, and the results from the early morning specimens were at least as good as those from the 24-hour specimens.

The total figures for the whole period are given in Table IV.

Table V reveals that out of the total of 47 patients investigated the urines of 36 (76.5%) were sterile at the end of the six-months course of treatment. Of the 11 (23.5%) who were positive four were resistant to streptomycin, two of whom had had over 150 g. of streptomycin elsewhere, before beginning our course of treatment. Occasionally tubercle bacilli have reappeared (after previous negative guinea-pig tests) in the urine of a patient during the latter half of the course of treatment. It is probable that the excretion of tubercle bacilli is intermittent except when the lesion is large and has a free communication with a calix. Again, the kidney may be reinfected from an active focus elsewhere, such as the spine or lung. It must be remembered that sometimes a secondary infection with other organisms, usually *Bact. coli*, may complicate matters and require treatment by the appropriate antibiotic. It is unfortunate that, owing to the somewhat indiscriminate and widespread use of antibiotics without bacteriological control, so many resistant strains of organisms were encountered.

TABLE V.—*Sterilization of Urine and Sensitivity of Organisms to Streptomycin*

Group	Initially Guinea-pig Positive	After 2–3 Months' Treatment			After 3–4 Months' Treatment			After 5–6 Months' Treatment			Remarks
		Guinea-pig Positive		Sensitive to Streptomycin	Guinea-pig Positive		Sensitive to Streptomycin	Guinea-pig Positive		Sensitive to Streptomycin	
		No.	%		No.	%		No.	%		
1	16	4	25	All sensitive to 0·25 u./ml.,	6	37	5 sensitive to 0·25 u./ml., 1 resistant to 32 u./ml.	5	32	4 sensitive to 0·25 u./ml. 1 resistant to 64 u./ml.	Of 4 patients who were guinea-pig positive after 2 months, 3 remained positive and 1 became negative. After 4 months' treatment, 3 patients who were guinea-pig negative reverted after 4 months' treatment. Two of these remained positive after 6 months
2	8	5	62	„ „	5	62	4 sensitive to 0·25 u./ml., 1 resistant to 64 u./ml.	3	37	2 sensitive to 0·25 u./ml., 1 resistant to 64 u./ml.	No new guinea-pig positives were noted during the course of treatment
3	10	5	50	4 sensitive to 0·25 u./ml., 1 resistant to 32 u./ml.	3	30	1 sensitive to 0·25 u./ml., 2 resistant to 32 u./ml.	3	30	1 sensitive to 0·25 u./ml., 2 resistant to 32 u./ml.	One patient who was guinea-pig positive at the fourth month became negative at the sixth month of treatment and 1 who was guinea-pig negative reverted to positive at the end of the sixth month
4	9	5	55	All sensitive to 0·25 u./ml.	2	22	Both sensitive to 0·25 u./ml.	—		—	The 2 patients who were positive at 4 months had transplantation of the ureter into the colon
5	4	1	20	Sensitive to 0·25 u./ml.	—	—	—	—		—	The patient who was positive died during the fourth month of treatment with silicosis and acute bronchopneumonic spread
Total	47	20	42	19 sensitive to 0·25 u./ml., 1 resistant to 32 u./ml.	16	34	12 sensitive to 0·25 u./ml., 4 resistant to 32 u./ml.	11	23	7 sensitive to 0·25 u./ml., 4 resistant to 32 u./ml.	

(b) Radiographic Changes

In no case was there any convincing improvement in the pyelographic appearances during treatment (Table VI). Intravenous pyelography has been carried out in every patient and a bilateral retrograde pyelogram whenever possible. We do not agree with Ericsson and Lindbom (1950) that retrograde pyelography is dangerous, and we have seen no complications in many hundreds of such examinations. It is desirable to carry out the retrograde pyelogram under direct vision in order to obtain an accurate picture of the pelvi-caliceal system. Recent experience with partial or polar nephrectomy has, however, made it clear to us that relatively extensive lesions may lie alongside a calix showing minimal deformity.

(c) Cystoscopic Improvement

In the course of this investigation over 200 cystoscopies and 150 ureteric catheterizations were carried out in the period January 1 to December 21, 1951. All cystoscopic examinations were done by two of us (J. C. R. and J. G. G.), and in each case a careful description of the bladder mucosa and the ureteric orifices was written without reference to previous cystoscopic notes. Definite improvement was found in all cases in the present series (in which the bladder

TABLE VI

Group	No. of Cases	Clinical Improvement									Cystoscopic Changes								Pyelographic Changes			
		Frequency of Micturition				Pain on Micturition				Weight	Bladder Appearance				Bladder Capacity							
		Normal	Unchanged	Improved	Deteriorated	Normal	Unchanged	Improved	Deteriorated		Normal	Unchanged	Improved	Deteriorated	Normal	Unchanged	Improved	Deteriorated	Normal	Unchanged	Improved	Deteriorated
1	16	10	—	6	—	14	—	2	—	11 gained, average 10 lb.; 5 lost, average 3 lb.	10	—	6	—	14	—	2	—	10	5	—	1
2	7	—	1	6	—	6	—	1	—	7 gained, average 14 lb.	—	—	7	—	4	—	3	—	—	6	—	1
3	10	—	2	8	—	2	2	6	—	6 gained, average 8 lb.; 4 lost, average 2 lb.	—	2	8	—	—	1	9	—	—	10	—	—
4	10	—	6	3	1	—	10	—	—	7 gained, average 6 lb.; 3 lost, average 4 lb.	—	3	4	3	5	3	—	2	—	7	—	—
5	4	—	—	4	—	—	1	3	—	2 gained 12 lb.; 2 lost, 1 4 lb., 1 6 lb.	—	1	3	—	—	1	2	—	—	4	—	—

was diseased) except for three (Table VI). The improvement consisted in the healing of granulations and ulceration and replacement of these by scar tissue, in addition to an increase in bladder capacity.

(d) Clinical Improvement

We have noticed that clinical improvement usually occurs at an early stage of the course, but in some patients it appears later, sometimes after three months' treatment. In almost every patient a clinical improvement was achieved and was assessed in terms of degree of frequency, nocturia, dysuria, etc. It is customary to denigrate in scientific communications all references to symptoms, but the symptomatic

TABLE VII.—*Effect of the Regime on the Extrarenal Lesion*

Chest lesions ..	12	Improved 3 Deteriorated 1 Unchanged 8	4 quiescent before treatment began
Bone and joint lesions	3	Unchanged 2 Deteriorated 1	2 quiescent before treatment began
Bone and joint and chest lesions	3	Improved 1 Unchanged 2	1 quiescent before treatment began
	3	Improved 1 Unchanged 2	2 quiescent before treatment began

improvement is vitally important from two points of view. The improvement is important to the patient not only because he is able to obtain more comfort and sleep, but also because he is encouraged to continue and complete his six-months course. The results are shown in Table VI.

Table VII shows the results in patients having combined lesions affecting also lungs, bones, joints, etc. In combined cases there is no significant improvement of the extrarenal lesion when compared with cases treated with streptomycin alone, or, as in the case of the lungs, with streptomycin and P.A.S. One important fact which should be mentioned, however, is that the seven patients whose sputa remained positive for tubercle bacilli at the end of the six-months period were all sensitive to 0.25 u./ml. of streptomycin.

Follow-up of Previous Series (Table VIII)

The group of 51 patients discussed in a previous article (Ross *et al.*, 1951) have been followed up on the lines indicated above. With few exceptions symptomatic and cystoscopic improvement has been maintained up to the present time, eighteen months since the completion of treatment. Of the remaining 43 patients of the original series still alive, the urine of 27 was sterile at 18 months.

The follow-up included a three-monthly cystoscopy and an inoculation of guinea-pigs with the deposit of both 24-hour and ureteric specimens of urine. It must be pointed out that the six patients given all three drugs were advanced cases falling into either type 4 or type 5. On the whole, the alternating method of treatment described here seems to be standing up to the test of time.

Two patients appeared to merit special mention, as they illustrated the fact that no case should be regarded as hopeless. The first man was admitted with active pulmonary and vertebral lesions, a tuberculous kidney, cystitis, and epididymitis. During his six months' treatment his extrarenal lesions healed and we were able to remove the non-functioning right kidney. Incidentally, this was the only patient in the series in whom complete healing of the epididymal lesion took place without operation.

In a second patient with a disorganized kidney operation revealed the presence also of a large solitary cyst. This is only the third case of tuberculous nephritis in which a solitary cyst has been recorded. It is interesting that the amount of streptomycin in the cyst was 250 u./ml. fluid, whilst the greatest amount in any ulcero-cavernous lesion was 8 u./ml.

Summary

An investigation begun two years ago has been carried a step forward by treating a further 47 patients.

The six-months course consists in a sanatorium regime, the usual surgical measures, and a combination of streptomycin, P.A.S., and ethizone. Our view still remains that the three drugs are not a substitute for surgery or sanatorium treatment, but that each is a complement to the other.

Assessment of the results has been carried out not only for the present series of patients but also for the original group of 51 reported a year ago. The most important single factor is the elimination of tubercle bacilli from the urine. To be certain of this, most exhaustive and searching tests were found to be necessary. Of the original group 62% of urines were sterile at the end of eighteen months, while 77% of urines of the present series were sterile at the end of a year.

While it is necessary to keep in mind the chronicity of the disease, the course of treatment suggested by us seems to achieve satisfactory results and to hold out a promise for the future.

We are grateful to Mr. J. Dobson, surgeon-superintendent, Wrightington Hospital, for his assistance and constant encouragement, to Herts Pharmaceuticals Ltd. for their interest,

TABLE VIII

Treatment	No. of Cases	6 Months	12 Months	18 Months
Streptomycin alone	18	13 remained sterile 3 positive 2 sterile, reverted to positive	9 sterile 3 reverted 1 given other course 3 died after transplantation of ureter 2 sterile	9 sterile 2 reverted 1 not traced 2 sterile
Streptomycin and P.A.S. together	7	4 sterile 1 positive 2 sterile, reverted to positive	4 sterile Died after ureterocolic transplant 1 died after ureterocolic transplant 1 given latest course	4 sterile
Streptomycin and P.A.S. alternately	20	19 sterile 1 positive	1 not traced 2 given latest course 12 sterile 1 died after thoracoplasty Died after ureterocolic transplant	10 sterile, 2 reverted, 1 died 2 still positive
Streptomycin, P.A.S., and thiacetazone (T.B.1)	6	6 sterile	4 sterile 2 reverted	2 sterile, 2 reverted 2 still positive
Total	51	Sterile 42 (82%)	1 not traced; 7 died after ureterocolic transplant; 4 given later course No. followed up, 39 Sterile 29 (74%)	1 not traced 1 died Total followed up, 37 Sterile 23 (62%)

technical help, and supplies of ethizone and calcium B.P.A.S.; and we are especially indebted to Miss A. Osborne, who has undertaken all the urine analyses, for allowing us the use of her notes. A fuller report will be published by her at a later date.

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THE SIGNIFICANCE OF THE THYROID IN PSYCHIATRIC ILLNESS AND TREATMENT

ROUTINE EXAMINATION WITH A RADIOACTIVE TRACER METHOD

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In previous communications we reported that abnormal indices of thyroid activity occur in a fair proportion of psychiatric patients (Reiss *et al.*, 1951b). Changes in the thyroid activity of such patients after E.C.T. and treatment with pituitary anterior lobe hormones were described (Reiss *et al.*, 1951a).

The thyroid activity is now investigated as a routine in the majority of patients admitted to our hospital, so that we have extended the studies further, and here report on some of the results of this work in more than 1,000 patients in 1949–50 and 1950–1. The question of whether there is a real causal interrelationship between ascertained thyroid disturbance and mental illness is examined in the light of these research results.

Methods.—The radioactive tracer methods used have already been described (Haigh and Reiss, 1950; Reiss *et al.*, 1952). The normal ranges are seen in Fig. 3. For the determination of the basal metabolism rate the usual spirometric method was used. Where complete relaxation of the patient could not be obtained the investigation was carried out under thiopentone. Methods of treatment are referred to in the description of each case.

Results

Distribution of Thyroid Indices

Figs. 1 and 2 are histograms of the distribution of the I_1 values in 302 male and 244 female psychiatric patients in 1949–50, and of 222 male and 271 female similar cases in 1950–1. Fig. 3 shows the histograms of the patients in 1949–50 superimposed on the histograms of 1950–1. The distribution of thyroid indices in about 1,000 unselected psychiatric patients in two successive years is seen to be almost exactly the same. For comparison, the limits for normal controls are plotted above the histograms of Fig. 3, and the arithmetic mean values are in good agreement for the corresponding values of the normal controls. These normal control values never overlapped the values recorded in patients who had clinical evidence of hypothyrosis or hyperthyrosis. It is clear that the spread of the patient material is much wider than the spread of the normals, and that among the patients there are a number in whom thyroid function lies outside the normal range but in whom clinical evidence of thyroid abnormality is lacking. The number of these borderline cases is appreciable, amounting to about 20%. The mean values of the thyroid indices in males are lower than in females, both in patients and in normal controls. In male borderline cases thyroid function tends towards hypothyroidism, and in females to hyperthyroidism.

Distribution of Thyroid Indices According to Certain Psychiatric Disease Categories

The cases were classified in a number of fairly well defined psychiatric categories, and the relation between these psychiatric disorders and their associated thyroid values is shown in Fig. 4. For this purpose the thyroid values were classified in four standards, as follows: the normal range was divided equally into upper and lower normal; outside these limits are the regions of underfunction and overfunction, which comprise mainly borderline cases.

In most groups there seems to be no significant relationship between the disease and the standard of thyroid function. There are, however, the following exceptions. In the female anxiety group there is a tendency to thyroid hyperfunction, more than 60% of the cases being in the upper normal or overfunctional range. In contrast, in the male anxiety group there is a tendency to thyroid underfunction, about 36% being lower normal and 38% underfunctional.

In 40% of female patients with recent schizophrenia the thyroid index was above the upper range of normality, but in female chronic schizophrenia this was seldom observed. In male recent schizophrenia, by contrast, underfunction of the thyroid was more usual.

Changes in Thyroid Function Accompanying Changes in the Psychiatric Illness Occurring Spontaneously or after Treatment

We have previously reported (Reiss *et al.*, 1951a) the effect of E.C.T. on thyroid function. The cases investigated were mainly depressives, which usually recover with E.C.T., and the series was small (34 cases). We have extended the investigation to include a more representative group of 183 cases of most common forms of psychiatric disorder treated in various ways or remitting spontaneously. Thyroid function was assessed before and after treatment, and compared with the clinical result. The forms of treatment included E.C.T., modified insulin, coma insulin, carbon dioxide, leucotomy, psychotherapy, and various combinations. A number of cases in which there was a spontaneous remission were also investigated.

In 76 of these patients there was evidence of disturbed thyroid function before treatment, and normal values in 107. Changes in the thyroid values of all the patients *after* treatment are shown in Tables I–III. In 82 of the 107 euthyroid cases (Table I) treatment produced no change or

TABLE I.—*Changes in the Thyroid Activity During Treatment of Euthyroid Patients*

Direction of Change	Changes in Mentation	
	Improved	Not Improved
No change	7	3
Changes inside the normal range ..	57	15
Change to hypofunctional range ..	12	7
Change to hyperfunctional range ..	5	1

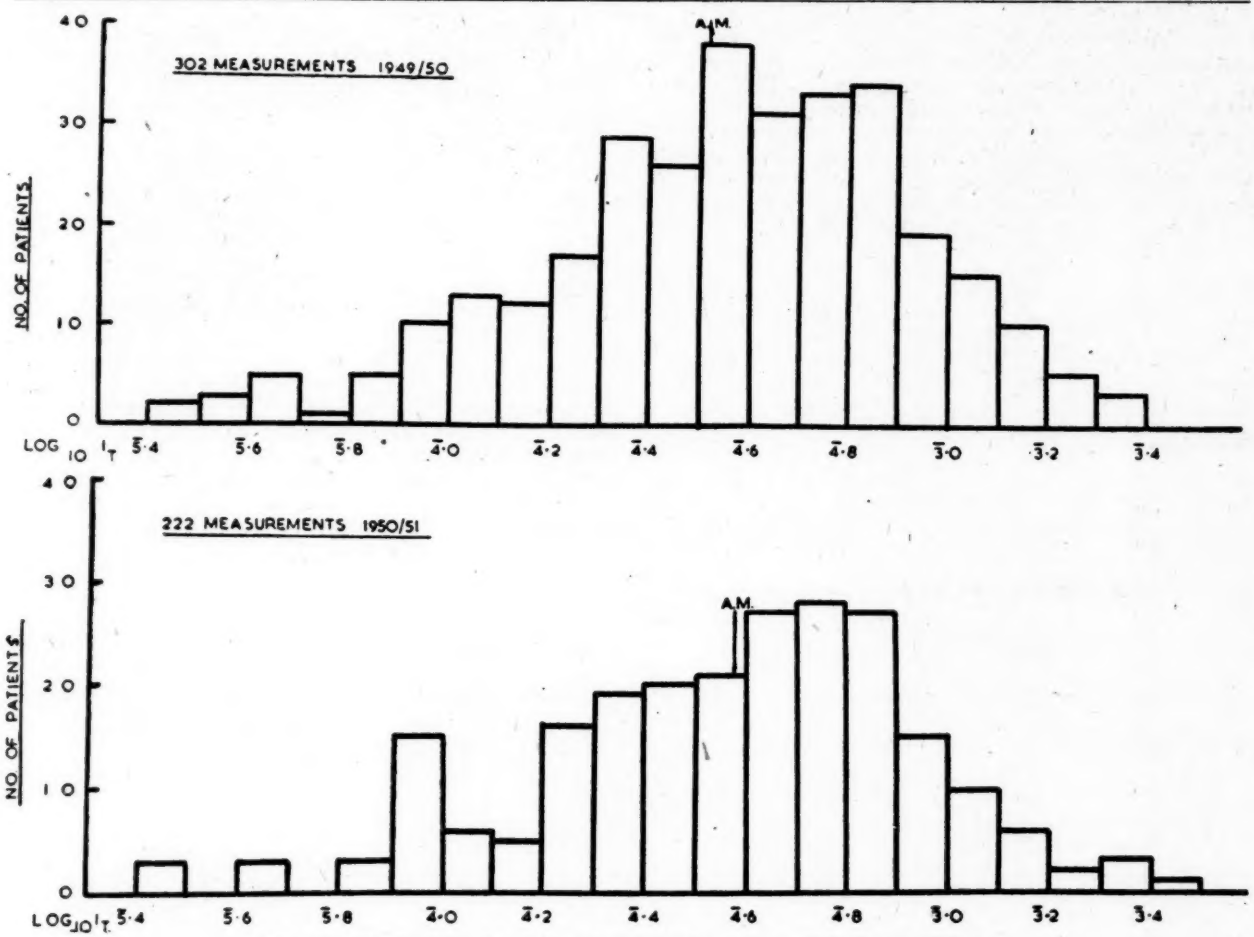

FIG. 1.—Distribution of $\log_{10} I_t$ values in male patients, 1949–50 and 1950–1.

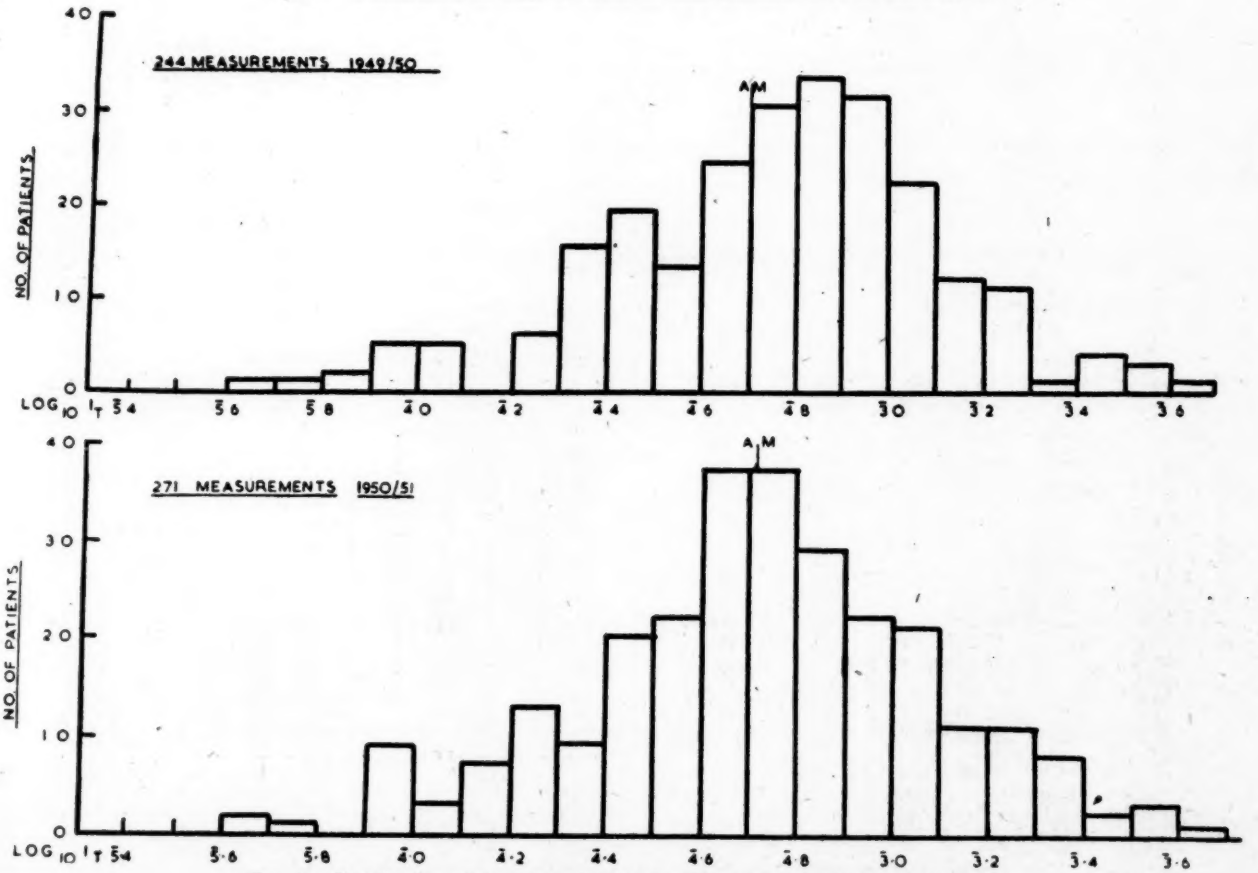

FIG. 2.—Distribution of $\log_{10} I_t$ values in female patients, 1949–50 and 1950–1.

changes only within the normal range; there was some slight change beyond the normal limits in the remaining 25 cases, 17 of whom made a clinical recovery. It is interesting that of the 82 patients who showed no change or change within the normal range only 22% failed to improve after treatment; while 39% of the patients whose thyroid levels became subnormal did not improve. Although suggestive, this difference is not statistically significant ($\chi^2 = 1.124$, with a corresponding P value of >0.20).

TABLE II

Thyroid Activity		Psychiatric Changes	
State Before Therapy	Change During Therapy	Improved	Not Improved
Underfunction	Normalized	20	0
	Not normalized	12*	5
Overfunction	Normalized	25	3
	Not normalized	7*	4

* The I_t in 12 of these 19 cases was improving, but the normal range was not yet reached at the time the mental improvement was detected. In one of the hyperthyrotic patients of this group the I_t was also decreased but below the normal range, and only 6 of the cases showed no change of the I_t in the right direction.

From inspection of the results in Tables II and III it is clear that there is no significant difference in the proportions of "normalized thyroid" improved and not-improved patients in the underfunction and overfunction categories,

TABLE III

Treatment	No.	Psychiatric Change		Thyroid Activity		Correlation Between Change in Thyroid and Psychiatric Change	
		Improved	Not Improved	Normalized	Not Normalized	Positive	Negative
E.C.T. ..	43	38	5	27	16	31	12
Psychotherapy	11	7	4	6	5	6	5
Spontaneous remission ..	9	9	—	7	2	7	2
Coma insulin therapy ..	3	3	—	3	—	3	—
Mod. insulin therapy ..	5	3	2	2	3	4	1
Other (CO_2, leucotomy)	5	4	1	3	2	4	1
Total ..	76	64	12	48	28	55	21

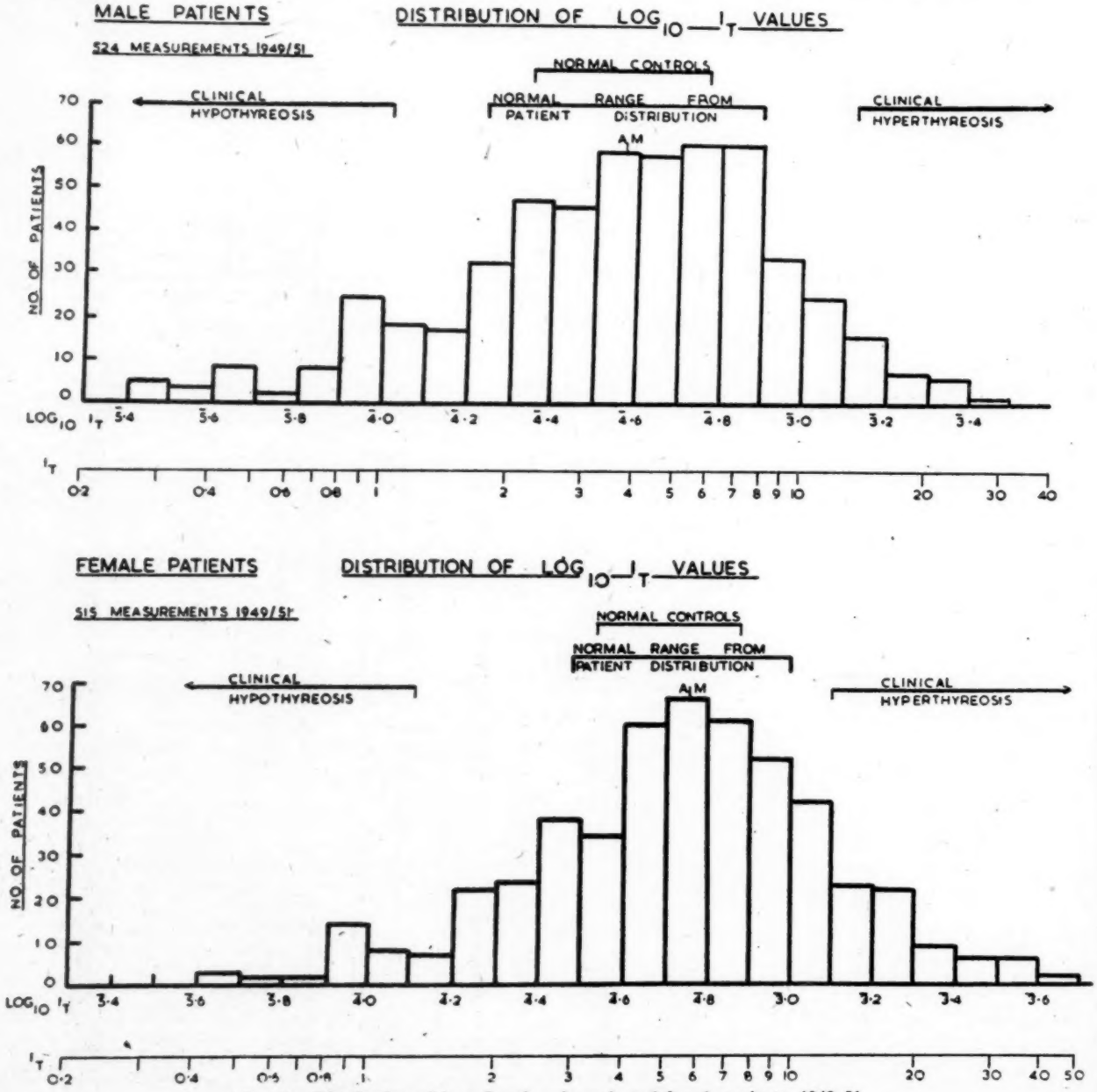

FIG. 3.—Distribution of $\log_{10} I_t$ values in male and female patients, 1949–51.

and that the proportions of "not normalized thyroid" improved and not-improved patients in these categories are also very similar. For statistical purposes, therefore, the underfunction and overfunction categories are combined, the proportion of "normalized thyroid" improved to not improved being compared with the proportion of "not normalized thyroid" improved to not improved, regardless of whether thyroid activity had shown underfunction or overfunction before treatment. This comparison indicates that there is a highly significant relationship between psychiatric improvement (as opposed to no change or deterioration) and normalization of thyroid activity. (The value of χ^2 is 7.076, using Yates's correction for continuity. This corresponds to a P value of <0.01, thus indicating that this relationship could occur by chance only once in 100 times.)

Treatment According to Thyroid Indications

It appeared reasonable to treat ascertained thyroid disturbances and observe the effects on the mental state. A number of patients suffering from various psychiatric illnesses were therefore given specific treatment on thyroid indications only.

We are well aware how controversial and sometimes conflicting have been the results of endocrine therapy in psychiatry reported by various authors, and how difficult it is to allow for the usual degree of apparent improvement after patients have settled down in hospital environment. We have therefore endeavoured to relate treatment and its results to suitable laboratory investigations and to have all patients followed up after discharge by doctors or social workers. We are still checking and revising our results in the light of what we know about the subsequent history of our patients. The thyroid disturbances were usually treated as follows.

Thyroid Underfunction.—Most patients were treated initially with thyrotrophic hormone for two weeks. If thyroid activity had been increased on reassessment with I^{131} at the end of this period it was assumed that the thyroid underfunction was secondary to primary pituitary underfunction, and treatment with thyrotrophic hormone was continued until the thyroid index became normal. If thyrotrophic hormone was ineffective primary thyroid underfunction was assumed, and the patients were then treated with dry thyroid tablets, or thyroxine or "thyranon" injections, until the B.M.R. became normal, as the tracer method cannot be reliably used during administration of thyroid hormones.

Thyroid Overfunction.—It may be assumed that in many cases hyperfunction of the thyroid is due to increased production of thyrotrophic hormone by the pituitary anterior lobe. Attempts to determine thyrotrophic hormone in blood to settle this question are being made in our department, but the method is not yet in clinical use. Nevertheless, in thyroid hyperfunction the direction of treatment at first is to suppress the production of thyrotrophic hormone with oestrone or A.C.T.H. Generally, 50,000 units of oestradiol were administered daily. In some cases the thyroid level fell to normal or below normal in the course of ten days. If there was no result treatment was continued with methylthiouracil (0.2 g. thrice daily) and 100 mg. of sodium iodide daily.

In some cases the thyroid value measured by I^{131} may be normal or subnormal, but the B.M.R. increased. Measured under strictly controlled conditions this seems to be due to hypersensitivity to thyroid hormone (see Reiss *et al.*, 1952), and these cases have been treated with ergotamine tartrate.

Although, for reasons mentioned before, we are not prepared at present to give statistics of the results of treatment, the following four cases are reported in some detail by way of illustration of the methods of treatment.

Case 1

A female university student aged 18 was admitted on November 26, 1950. Diagnosis: hebephrenic schizophrenia of gradual onset; duration about a year. There was considerable thought disorder, with hallucinations. She was deteriorating. November 28: thyroid index, I_t=18.8 (considerably increased); B.M.R. (under thiopentone) +27%; no clinical signs of hyperthyroidism. Treatment: methylthiouracil, 0.2 g. t.d.s., combined after a week with 100 mg. NaI daily. The B.M.R. (under thiopentone) on January 8, 1951, was −5% and on February 2 was −1%. The B.M.R. (without thiopentone) was +0% on February 13, +3% on February 28, and −3% on March 20.

Clinical Progress.—January 8, 1951: marked improvement in thinking; disappearance of hallucinations; good insight; gained 12 lb. (5.4 kg.) in weight. March 10: discharged symptom-free. June 15: social worker reported that patient was teaching at a small school; mentally normal. October 27: normal; had resumed work at the university. February 1, 1952: attending regularly as an out-patient; began to relapse; much thought disorder with delusions and completely incongruous emotion. February 16: readmitted; I_t at time of admission 15.0 (again increased); psychiatric state as before. March 6: "oestroform," 3,000 units daily, with NaI, 100 mg. daily. March 20: state unchanged; B.M.R. now reduced to −13%. April 7: thought disorder as before. June 9: much improved and mentally clear; rational but a little dull; B.M.R. −3%. July 9: remained improved; I_t=0.4, B.M.R. −8%. August 26: remission; awaiting discharge; contemplating taking up a teaching post.

Case 2

A married woman aged 31 was admitted on December 8, 1950. Diagnosis: anxiety state, moderately severe, with

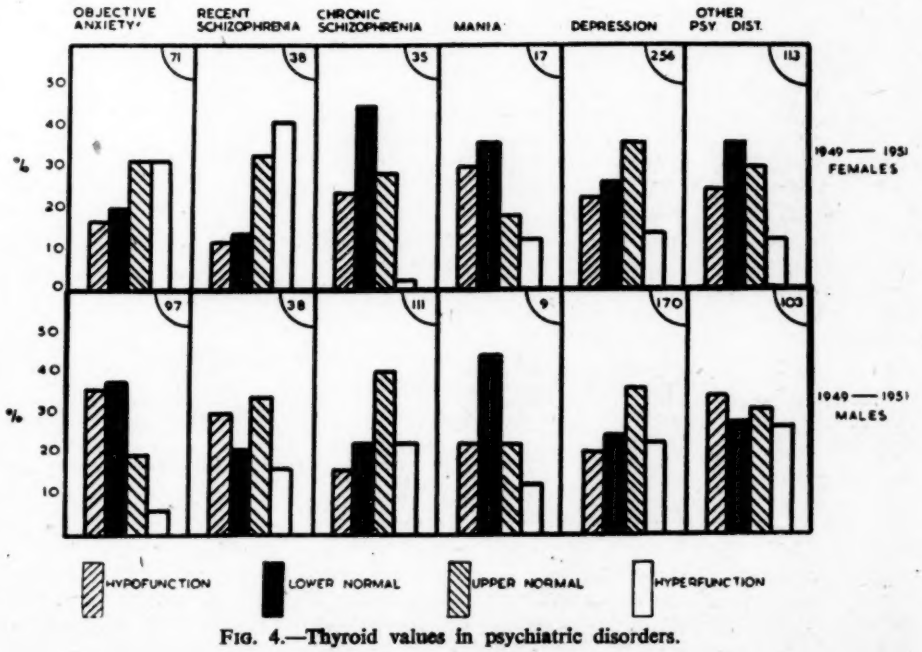

FIG. 4.—Thyroid values in psychiatric disorders.

panic attacks, palpitations, much somatic discomfort, and disturbance of sleep. Immature personality. Acute onset five months before admission. December 1 : I_t=16.8 (increased value). December 20: B.M.R. +25%. Treatment: patient showed positive prolan I reaction, and general hyperfunction of the pituitary anterior lobe was assumed. Treatment was therefore with oestrone instead of thiouracil. January 4, 1951: 50,000 units oestroform and 100 mg. NaI daily. January 29: oestrone dose reduced to 9,000 units daily. February 1 : I_t=0.3.

Clinical Progress.—She began to improve more quickly than is usual with thiouracil treatment, and ten days after treatment started she was eating and sleeping well and the panic attacks had disappeared. February 18: discharged, recovered; still remains well.

Case 3

A labourer aged 20 was admitted on February 10, 1949. Diagnosis: chronic hebephrenic schizophrenia; duration two years; marked thought disorder, with delusions and hallucinations. Unemployable. May 9 : $K=0.37\times10^{-3}$ (very reduced value); 17-ketosteroid excretion, 12.2 (normal); cortin excretion, 2.6 (normal). Treatment with thyroid, 1 gr. (65 mg.) twice daily, for hypothyroidism. May 23: if anything, worse. May 30: marked subjective and objective improvement. Discharged on July 2. Although symptom-free, probably a little slow. Instructed to continue taking thyroid, 1 gr. (65 mg.) twice daily. Remained so well that in February, 1950, he stopped taking tablets, and two weeks later he relapsed and was readmitted in much the same state as previously.

March 24, 1950 : I_t=1.3 (subnormal); treated with thyrotrophic hormone. April 12 : I_t=2.9 (normal range); rapid improvement. Discharged on May 6. Thyroid, 1 gr. (65 mg.) twice daily, continued. Remained well while continuing treatment for the next 10 months. Relapsed on July 4, 1951, and readmitted as before. July 5 : I_t =0.5 (very subnormal); treatment as before with thyrotrophic hormone. August 17 : I_t=2.1 (normal). Considerable psychiatric improvement. Maintenance therapy begun by replacing thyrotrophic hormone by thyroid sicc. twice daily. Discharged on November 12. At this time there was still some flattening of effect and dullness, but no florid symptoms. He has remained symptom-free and at work, and is still taking thyroid, 1 gr. (65 mg.) twice daily. August 26, 1952 : patient has remained well on thyroid, 1 gr. (65 mg.) twice daily.

Case 4

A male clerk aged 46 was admitted on April 18, 1951. Diagnosis: chronic anxiety neurosis of 17 years' duration, with panic states, various phobias, lack of confidence, and inability to sleep, most pronounced for six months before admission. He had given up work. April 26: K=0.52; I_t=0.8 (very subnormal). May 17 : condition rather worse; treatment begun with 400 units thyrotrophic hormone daily. May 22 : K=1.05; I_t=1.7 (still subnormal). June 14 : K=2.2 (lower normal range).

Clinical Progress.—From about May 31 some improvement. A fortnight later, more confidence and less anxiety. Discharged on June 29. Still mildly anxious, but phobias had disappeared. More confident and capable of handling business.

Discussion

The distribution of values of thyroid activity in the psychiatric hospital population presented here agrees in general with our previous reports dealing with much smaller numbers of patients.

It seems fairly clear, as we have discussed before, that there are a great many intermediate states and borderline cases of thyroid disturbance in psychiatric patients as compared with normals. This might be regarded as a reflection of a general constitutional abnormality or weakness in some psychiatric subjects and not of aetiological importance. We think this is not the case, for when the case material is broken down into groups it will be seen that hypofunction and hyperfunction are more commonly found in some disorders than in others; and, further, that thyroid function is usually corrected in patients who recover, and in some cases it corrects itself as psychiatric recovery takes place.

On the basis that there is a neuro-endocrine interrelationship, the disturbances of the thyroid may be a consequence or a cause, primary or contributory, of mental disorder. However, in most cases the whole disorder has progressed so far that there is a vicious circle, so that we can only speculate on the primary pathological factor.

The statistical evaluation of a large group of patients in whom there was disturbed thyroid activity before treatment, and who showed mental improvement parallel with normalization of the thyroid function, points significantly to a close correlation between the processes of mental and thyroid restoration. We do not think it likely that the changes in the thyroid and mental disorder could have occurred independently without causal interrelationship. It is obvious that in some cases mental improvement may have been responsible for the thyroid normalization, but in others—especially where the improvement in thyroid state preceded mental improvement—it is possible that the thyroid disorder was primary, or was part of a complex endocrine disturbance responsible for mental abnormality.

The most convincing proof that abnormal thyroid activity in some cases is responsible for mental disturbance is the remission of symptoms in patients treated for the thyroid disorder alone. Although we have reported here in some detail four satisfactory cases, a very large series would have to be produced to prove this point and to provide case material for further research in causation.

The purely empirical treatment of psychiatric disorders with hormones and drugs alike is rightly in discredit. We are of the opinion that reporting small numbers of cases who have improved, apparently as the result of hormone treatment, only adds to the confusion unless in each case there have been systematic and continued laboratory investigations. With the methods at present at our disposal this is an ideal very hard to achieve, but—in the case of the thyroid—not outside the possibilities of many of the larger psychiatric research units.

Summary

The indices of thyroid activity in 1,000 psychiatric patients, using the I^{131} tracer method, have been studied in two successive years.

About 20% were outside normal limits.

The histograms of the distribution of indices in 1949–50 and in 1950–1 are almost identical.

Thyroid function in relationship to various psychiatric disorders, treatments, and spontaneous remissions have been studied and discussed.

In a significant number of cases in which the thyroid indices were abnormal before treatment normalization of the thyroid accompanied mental improvement.

Our thanks are due to Dr. K. R. L. Hall and his staff for the statistical evaluation of the results.

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Last year the Pharmaceutical Society initiated legal proceedings in 43 cases under the Pharmacy Acts (1852–1941), the Penicillin Act (1947), and the Summary Jurisdiction Act (1848); only five of these cases proved unsuccessful. This fact is among information contained in the Registrar's Report of the Pharmaceutical Society for 1952, which was published recently.

ANTICOAGULANTS IN MYOCARDIAL INFARCTION

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The treatment of myocardial infarction with anticoagulants is generally accepted in the United States of America. In Great Britain a number of physicians do not treat their patients in this way, although most papers published here support the American view. The decision to use anticoagulants impels most physicians to admit their patients to hospital for a stay of several weeks, a matter of economic as well as medical importance. The present paper attempts to provide further evidence on the efficacy or otherwise of anticoagulant therapy and the suitability of certain types of patient for this treatment.

The problem was approached by a study of the effects of anticoagulant therapy on the prognosis of patients admitted to hospital with myocardial infarction, by determining if anticoagulant therapy was of equal benefit to all patients of all ages and with different degrees of shock, and by the analysis of notes and post-mortem reports to find how anticoagulant therapy affected the mortality.

Material

Two hundred patients admitted to the Radcliffe Infirmary as emergencies between January, 1945, and May, 1952, were suitable for the investigation; 125 of them were controls and 75 received anticoagulant therapy. In this hospital the duty of admitting medical emergencies is shared between four physicians. There is no selection of the type of case admitted under each physician; one physician admits medical emergencies on Mondays, and the other three in turn for periods of three days in succession.

The notes of all patients admitted between January, 1945, and May, 1952, with a diagnosis of myocardial infarction have been reviewed. Cases were rejected if the diagnosis was in doubt, if the notes were inadequate, or if the use of anticoagulant therapy was contraindicated,—for example, by an accompanying cerebrovascular accident or by a recent history of melaena. The diagnosis was based on the clinical history and positive electrocardiographic evidence in 179 cases, the clinical history and post-mortem evidence in 18 cases, and the clinical history alone in three cases. Of the 70 patients who died, 52 were submitted to a post-mortem examination.

The patients in the control group fell into two categories —75 admitted before 1950, in which year anticoagulant therapy was coming into general use in the Radcliffe Infirmary, and 50 admitted in and after that year. As the death rates in the two categories were 39% and 44% respectively it was felt that all the patients were suitable for inclusion in the control group. In fact, the use and choice of anticoagulants was determined by the views of the physician under whose care the patient was admitted, and there was no obvious medical reason why the patients in the second category did not have anticoagulant treatment.

The case notes of both series have been analysed to show the following facts:—(1) Age. (2) Sex. (3) Time from the onset of infarction to admission and to discharge or death. (4) Cardiac function before the onset of infarction, four categories being used: (I) no cardiac symptoms, (II) mild angina pectoris or a reduction in exercise tolerance, (III) severe angina pectoris or a great reduction in exercise tolerance, and (IV) frank heart failure. (5) Signs of previous cardiovascular disease before admission: this was judged to be present, absent, or not recorded; if present, one or more of the following signs of cardiovascular disease had been recorded—abnormal rhythm, hypertension, enlarged heart, or evidence of previous infarction. (6) The degree of shock at onset and on admission was assessed as "none or mild," "moderate," "severe," or "not recorded" by consideration of the severity of the pain and its duration and response to opiates, blood pressure, pulse rate, and appearance of the patient. (7) The electrocardiogram. (8) Further thrombo-embolic accidents. (9) The post-mortem report. (10) Cause of death.

In the treated group the following facts were also recorded: type of anticoagulant used, whether heparin, dicoumarol, or ethyl biscoumacetate ("tromexan"); time from the onset of infarction to the beginning of effective anticoagulant therapy, which was taken as the giving of 10,000 i.u. of heparin intravenously or a fall in prothrombin efficiency to under 20% of normal; the duration of effective anticoagulant therapy; and the occurrence of complications resulting from treatment.

Control of Anticoagulant Therapy

Heparin was used in some cases, but only to initiate treatment, and no laboratory tests were necessary, because the dosage used was not large enough to cause lengthening of the clotting-time for a whole 24-hour period. Dicoumarol and ethyl biscoumacetate therapy were controlled by the one-stage prothrombin test as described by Biggs and Macfarlane (1949). When dicoumarol was used the aim of treatment was to maintain the clotting-time between one and a half and two times that of the normal control. This change in clotting-time interpreted from the dilution curve given by Biggs and Macfarlane represents a range of prothrombin efficiency between 10 and 20% of normal. With ethyl biscoumacetate a slightly smaller margin of safety was allowed because it was found that the level of clotting-time could be adjusted more rapidly. With this drug the therapeutic range of clotting-time was taken to be one and a half to two and a half times the control clotting-time, or 7.5 to 20% of prothrombin efficiency, a range similar to that used by Tulloch and Gilchrist (1950).

Results

The mortality in the two groups of cases is shown in Table I.

TABLE I.—*Mortality*

Group	No. of Cases	No. that Survived	No. that Died
Control	125	74 (59%)	51 (41%)
Treated	75	56 (75%)	19 (25%)

The calculation of χ^2 gives a value of 4.27, corresponding to a probability of about 0.04.

As the mortality rate might have been influenced by factors other than anticoagulant drugs, the two groups were further analysed to try to find out if there were any patients for whom the prognosis was strikingly good or bad in either the control or the treated group. The time from onset to admission was similar in the two groups (Table II). The importance of taking this into considera-

TABLE II.—*Cases Admitted in First 48 Hours and in First Seven Days*

Group	Admitted in	
	First 48 Hours	First 7 Days
Control	68%	83%
Treated	59%	82%

tion when comparing methods of treatment has been demonstrated by Tulloch and Gilchrist (1950) and by Yater *et al.* (1948).

Cassidy's (1946) series of 1,000 cases had a male-to-female ratio of 3.5 to 1. In the present series the ratio was approximately 2 to 1, the figures in the control group being 82:43 and in the treated group 50:25.

Other factors which might influence the prognosis are age, degree of shock, and cardiac function before the infarction. In Tables III, IV, and V the two groups are compared for each of these factors and shown to be similar, except in degree of shock at onset, where the number of severely shocked patients was larger in the treated group.

The notes of the two groups were examined for evidence of objective signs of previous cardiovascular disease, but it was found that in about half of the cases no information was available. In the remaining half there was a record of some kind of cardiovascular disease in all but four of the control group and all but two of the treated group. This means that the state of the myocardium before the infarction had to be assessed on the subjective evidence of cardiac function, since objective evidence was lacking in a large number of cases.

The cases were then divided up into those mildly, moderately, and severely shocked, and the mortality in each section was considered separately. The results are shown in Table VI, which brings out the influence of the severity of shock on the prognosis of patients not treated with anticoagulants, and suggests that anticoagulants are of value in patients who are moderately and severely shocked. This point is clearly emphasized by Gilchrist (1952), whose article appeared after the present paper had been prepared.

The state of the myocardium before the infarction naturally affects the prognosis, and the figures in Table VII suggest that only those patients with a good cardiac function before infarction receive benefit from anticoagulant treatment. In Table VIII the influence of age on mortality in the control and treated groups is considered.

The results in the present series suggest that older patients have a worse prognosis if untreated, but a more striking reduction in mortality when anticoagulants are used. Thus age, degree of shock, and cardiac function are shown to influence the mortality from myocardial infarction and the benefit received from anticoagulants. Tables IX and X show that these three factors are independent of one another and are not, as might be expected, due only to the influence of age. In 11 cases it was impossible to decide from the notes what the cardiac function was before the infarction.

It is generally accepted that the prognosis is better for older patients and better for women than for men. In Table XI the greater reduction in mortality for women as a result of the use of anticoagulant therapy may be due to the fact that the women were on the whole older, 70% being over 60, whereas only 50% of the men were over 60.

TABLE III.—*Number of Patients in Each Decade from 40 to 90*

Group	Age in Years				
	40–49	50–59	60–69	70–79	80–89
Control ..	19 (15%)	27 (22%)	45 (36%)	28 (22%)	6 (5%)
Treated ..	15 (20%)	23 (30%)	24 (33%)	13 (17%)	0

TABLE IV.—*Number of Patients in Each Category of Shock*

Group	Degree of Shock at Onset			
	None or Mild	Moderate	Severe	Not Recorded
Control ..	42 (33%)	48 (39%)	31 (25%)	4 (3%)
Treated ..	13 (18%)	37 (49%)	25 (33%)	0

TABLE V.—*Number of Patients in Each Category of Cardiac Function Before the Infarction*

Group	Cardiac Function				
	Category				Not Recorded
	I	II	III	IV	
Control ..	33 (26%)	60 (49%)	20 (16%)	4 (3%)	8 (6%)
Treated ..	18 (24%)	39 (52%)	15 (20%)	0	3 (4%)

TABLE VI.—*Influence on Death Rate of Degree of Shock Due to Infarction*

	Degree of Shock			
	None/Mild	Moderate	Severe	Not Recorded
Deaths and death rates in control group	10 (24%)	19 (40%)	21 (68%)	1 (2%)
Deaths and death rates in treated group	3 (23%)	7 (19%)	9 (36%)	0

The numbers in the treated group are too small for the result to be statistically significant.

TABLE VII.—*Influence of Cardiac Function Before Infarction on Death Rate*

	Cardiac Function Before Onset		
	Categories I and II	Categories III and IV	Not Recorded
Deaths and death rates in control group	37 (41%)	9 (38%)	5
Deaths and death rates in treated group ..	12 (21%)	7 (46%)	0

TABLE VIII.—*Death Rate of Patients Over and Under 60*

	Under 60	Over 60
Deaths and death rates in control group	16 out of 46 (35%)	35 out of 79 (44%)
Deaths and death rates in treated group	11 out of 38 (29%)	8 out of 37 (21·5%)

TABLE IX.—*Number of Patients Over and Under 60 in Each Category of Shock and in Each Category of Cardiac Function*

	Under 60	Over 60
Shock:		
Mild	18 (21%)	37 (32%)
Moderate	40 (48%)	45 (39%)
Severe	23 (31%)	33 (29%)
Cardiac function:		
Categories I and II ..	65 (81%)	84 (77%)
Categories III and IV ..	15 (19%)	25 (23%)

TABLE X.—*Degree of Shock Resulting from Infarction in Relation to the Cardiac Function Before the Infarction*

	Cardiac Function	
	Categories I and II	Categories III and IV
Mild shock	42 (29%)	13 (32·5%)
Moderate shock	67 (46%)	14 (35%)
Severe shock	37 (25%)	13 (32·5%)

TABLE XI.—*Death Rate in Men and Women*

Group	Male		Female	
	Survived	Died	Survived	Died
Control	49	33 (40%)	25	18 (42%)
Treated	35	15 (30%)	21	4 (16%)

Discussion

The prognosis of so common a disease as myocardial infarction is uncertain because it is difficult to ascertain the incidence and death rate. In the present paper we

have necessarily had to confine ourselves to a study of those patients who survived long enough to reach hospital. We found that the mortality rate was reduced by anticoagulant therapy from 41 to 25%, a difference that is statistically significant and comparable with the figures of Tulloch and Gilchrist (1950).

The groups of patients who appeared to receive most benefit from anticoagulants were those over 60 years of age, those who were moderately and severely shocked, and those whose cardiac function immediately before the myocardial infarction was impaired slightly or not at all.

It is not merely a question of academic interest to decide what type of patient is most likely to benefit from anticoagulants, because most physicians find treatment practicable only in hospital, and many more cases of myocardial infarction are admitted now than formerly. Table XII shows that more patients were admitted to the Radcliffe Infirmary in 1951 (66) than in the four years 1945–8 (62). Unless there is a change in the management of patients with myocardial infarction which allows satisfactory treatment in the home, the number of patients admitted to hospital will increase. This is an important economic fact, because anticoagulant therapy does not shorten the period in hospital. In the control group the average stay was 39 days and in the treated group 45 days. The number of persons in the age groups with the highest incidence is increasing, and the cost of a hospital bed in the Radcliffe Infirmary reached the figure of £17 12s. 3d. a week in 1951.

TABLE XII.—*Number of Patients Admitted with Myocardial Infarction each Year from 1945 to May, 1952, and the Proportion Receiving Anticoagulant Therapy (Only the Cases Included in the Present Series are Recorded)*

Year	No.	No. Treated with Anticoagulants
1945	4	0
1946	20	0
1947	14	0
1948	24	4 (17%)
1949	18	2 (11%)
1950	32	15 (48%)
1951	66	36 (55%)
Jan.-May, 1952	22	18 (82%)

The death rate in the series of 800 cases reported by the American Heart Association was 24% in the controls and 15% in the treated group. The difference was thought to be due chiefly to a reduced incidence of thrombo-embolic deaths. One of our chief difficulties in making a retrospective survey was that vital information about the patient's mode of death is so often lacking, and even with very comprehensive post-mortem notes the exact cause cannot be found, although contributory causes may be evident, and in many cases no more precise diagnoses than those listed in Table XIII could be made. It is for this reason that the admittedly vague terms "sudden death," "continued shock," and "heart failure" had to be used.

TABLE XIII.—*Causes of Death*

Cause	Control Group	Treated Group
Sudden death	25	11
Continued shock	10	2
Heart failure	12	6
Ruptured ventricle	2	0
Haematemesis	2	0

An attempt is made to answer the question posed in a leading article in the *British Medical Journal* of October 28, 1950 (p. 991), of how many of the deaths were inevitable. By inevitable we mean, for instance, a severely shocked patient dying within an hour of admission or a patient found after death to have a ruptured ventricle.

Table XIV shows the numbers in each category after the inevitable deaths have been subtracted, and has been included although we realize that the word inevitable as used here has no absolute value but is a retrospective assessment. For the same reason no deduction of inevitable deaths has been made throughout the paper.

TABLE XIV.—*Causes of Death After Subtraction of Inevitable Deaths*

Cause	Control Group	Treated Group
Sudden death	25	9
Continued shock	4	2
Heart failure	10	1

Thrombo-embolic accidents other than myocardial infarction which developed while the patients were in hospital numbered 27 (21%) in the control group and 11 (15%) in the treated group. The incidence is low because adequate records of suspicious incidents were sometimes lacking.

Thus in the present paper there is no definite indication how anticoagulant therapy lowers the mortality rate from myocardial infarction, although it is quite clear that there is a significant reduction.

While we do not feel that it is yet justifiable to withhold anticoagulant therapy from any patient suffering from myocardial infarction, provided no contraindication exists and proper laboratory facilities are available, our results suggest that certain types of patient may be specially suitable for that treatment.

Summary

The case histories of 200 patients admitted to the Radcliffe Infirmary with myocardial infarction between January, 1948, and May, 1952, have been reviewed.

The death rate in hospital was 41% in the control group of 125 cases and 25% in the treated group of 75 cases, a difference which is statistically significant.

Anticoagulant therapy seemed to be of most value to patients over 60 years of age, moderately or severely shocked, and with little or no previous impairment of cardiac function.

No complications resulted from anticoagulant therapy.

We wish to thank the physicians of the Radcliffe Infirmary for permission to use the case reports of their patients; Dr. A. H. T. Robb-Smith, Dr. R. G. Macfarlane, and Dr. Rosemary Biggs for the pathological and haematological data; Dr. I. Sutherland and Dr. D. J. Finney for advice and the statistical calculations; and Miss Betty Merry, of the Records Department, Radcliffe Infirmary.

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The Sixth Laboratory Animals Bureau Congress was held at the Royal Veterinary College, London, on March 27 and 28. Some 250 technicians from all parts of the country attended. The congress was opened by the secretary of the Medical Research Council, Sir Harold Himsworth. Six short papers were read by technicians, and one long one, on reproduction in mammals, by Dr. I. W. Rowlands, of the Agricultural Research Council Institute of Animal Physiology, Babraham. Visits were paid to the National Institute for Medical Research, Mill Hill, and to the Lister Institute at Elstree, and a programme of films of zoological interest was shown at the College. The final session was "Question Time." Chairmen at the four sessions were Professor S. P. Bedson, F.R.S., Dr. L. Harrison Matthews, Dr. R. Lovell, and Professor R. E. Glover. The proceedings of the Congress will be published in full in the journal of the Animal Technicians Association.

RUPTURE OF THE HEART AS A RESULT OF BR. ABORTUS ENDOCARDITIS

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Undulant fever is not a rare disease in this country; yet endocarditis due to *Brucella* organisms has only twice been recorded here (Rennie and Young, 1936; Hart *et al.*, 1951), and only in the latter case was it confirmed bacteriologically at necropsy. Dalrymple-Champneys (1950), in his series of 983 cases of undulant fever, does not record a single example. In the foreign literature we have found accounts of a further 21 cases confirmed bacteriologically at necropsy; most of these have been reviewed by Hart *et al.*

There seems to have been no previous example of a sudden fatal termination by massive haemorrhage into the pericardium.

Case History

A 51-year-old forestry nurseryman had had no previous severe illness. In July, 1950, he complained of sudden partial loss of vision in the right eye. An ophthalmologist found pale patches below and to the nasal side of the disk, with a complete central scotoma. The blood pressure was 75/50.

When admitted to hospital on September 25 he was a thin ill-looking man with pigmented patches on the forehead. The blood pressure was 95/60; Hb 78% (11.5 g. %), and the white blood cells numbered 4,500 per c.mm. (76% polymorphs). The Wassermann reaction and Kahn test were negative. The urine contained a trace of protein and scanty hyaline casts.

A rigor occurred the day after admission, but following this his temperature showed only an occasional rise to 99° F. (37.2° C.). On October 17 his serum agglutinated a standard suspension of *Br. abortus* in a dilution of 1/3,200. His general condition improved steadily, the sight in the affected eye gradually returned, and his temperature settled. In view of this no specific treatment for the abortus infection was given. He seemed well in himself on discharge on October 26, but his E.S.R. remained high—54 mm. in one hour (Wintrobe).

A month later his ankles began to swell and he became breathless on exertion. During the following week, early in December, he was readmitted with nocturnal dyspnoea and a temperature of 100–101° F. (37.8–38.3° C.). This pyrexia settled after four days, and was assumed to be due to an associated bronchitis.

Examination showed oedema of the ankles and sacral region, and some clubbing of the fingers. The pulse rate was about 100, with frequent extrasystoles, and a systolic murmur could be heard over the whole praecordium. A chest *x*-ray film showed moderate enlargement of the heart, chiefly left ventricular; the blood pressure was 95/60. The symptoms of congestive failure improved with treatment and the oedema practically disappeared, but a temperature of 99–100° F. (37.2–38.8° C.) recurred during the week before he was allowed to return home on December 23, for Christmas.

When readmitted on January 6, 1951, the signs of congestive failure had returned more severely, the legs were grossly oedematous and the breathing was distressed. The pulse rate was 100 and regular, and the blood pressure 105/75. No cardiac murmur could now be heard. The only electrocardiographic findings were slurring of the P–R interval with a depressed T wave in all leads except CF 4; both auricular and ventricular extrasystoles were occurring. A blood count showed Hb, 11.1 g. % (75%); white cells, 5,500 per c.mm. (banded polymorph neutrophils 3%, segmented polymorph neutrophils 88%, lymphocytes 5%, monocytes 4%). He remained afebrile and a single blood culture at this time was sterile. Yet he steadily became worse and died suddenly on January 14, eight days after his readmission and six months after his first symptoms.

Thus the clinical course of the illness was that of a mild *Br. abortus* infection with apparent spontaneous recovery, followed by rapid congestive heart failure. He had had comparatively few of the usual signs and symptoms associated with bacterial endocarditis. The original blindness may have been due to an embolus, but none other was observed. The spleen was never palpable and the patient was afebrile during most of his illness.

Necropsy Findings

A post-mortem examination was carried out 50 hours after death. The heart (275 g.) was not enlarged. The left ventricle was 17 mm. thick, the right ventricle 6 mm. The coronary arteries were healthy. The tricuspid, pulmonary, and mitral valves were normal. The aortic valve was bicuspid, a single large cusp replacing the usual right and non-coronary cusps (see Figs. 1 and 2). This combined cusp was smaller than two normal ones but larger than a single one: it measured 40 mm., while the other (left) cusp measured 33 mm.

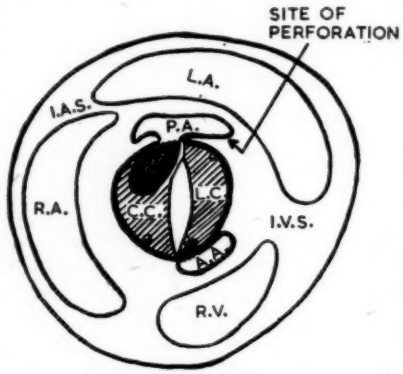

FIG. 1.—Diagram of transverse section of heart at level of aortic valve. L.A.=left auricle. R.A.=right auricle. R.V.=right ventricle. I.A.S.=interauricular septum. I.V.S.=interventricular septum. P.A.=posterior aneurysm. A.A.=anterior aneurysm. L.C.=left cusp. C.C.=combined cusp. Black areas show perforations in cusps. O represents coronary orifices.

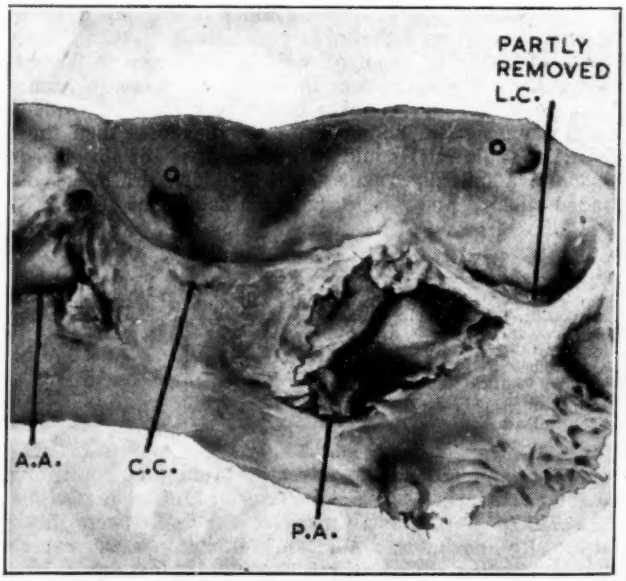

FIG. 2.—Part of aortic valve, opened out after cutting through the left cusp. The top of this cusp with attached vegetations has been removed to show opening into posterior aneurysm. Lettering as in Fig. 1.

Opposite the centre of the combined cusp a low ridge ran along the wall of the aortic sinus in the long axis of the aorta. It was 3 mm. wide and less than 1 mm. high, with a rounded outer surface and parallel borders—an appearance almost pathognomonic of a congenital lesion (Koletsky, 1941). Microscopical examination of serial longitudinal sections through the ridge confirmed this. They showed a thickening of the elastic-containing media only and no evidence of an inflammatory reaction. If the lesion had been acquired, such a central ridge should have contained fibrous tissue from the annulus fibrosus on the lumen side of the elastic tissue of the aortic media (Lewis and Grant, 1923).

There were large friable vegetations on both cusps, especially posteriorly, where their margins were fused together for a distance of 1.5 cm. Microscopically these vegetations consisted of fibroblasts with a few lymphocytes and histiocytes, covered by blood clot, fibrin, hyaline necrotic material, and masses of Gram-negative coccobacilli. The posterior third of the combined (right) cusp had been almost completely destroyed by ulceration; only a narrow band at the free margin remained attached to the aorta posteriorly; beneath this was a ragged hole about 2 cm. in diameter. There was also a smaller hole in the other (left) cusp near its attachment anteriorly. Both cusps were slightly thickened. Microscopically the larger showed fibrosis (maximum thickness 3 mm.), and at its junction with the aorta some small deposits of calcium were identified by von Kossa's method. Such changes are common in congenital bicuspid valves in the absence of infection (Lewis and Grant, 1923).

The myocardium, although its cut surface appeared normal to the naked eye, was under the microscope diffusely inflamed, especially just beneath the endocardium. Numerous small foci of necrosis scantily infiltrated with mononuclear and occasional polymorph cells were seen, and also collections of similar cells unassociated with muscle necrosis and having a very occasional central foreign body giant cell. Near the aortic valve there was an occasional acute abscess full of polymorph leucocytes. No fibrosis of muscle was seen apart from a patchy area in the interauricular septum. Since none of these lesions resembled an Aschoff nodule, and since the mitral valve and the endocardium of the left auricle appeared healthy, old rheumatic infection seemed unlikely.

The aortic sinuses opposite the two holes in the cusps were greatly dilated to form localized smooth-walled aneurysms. The smaller (anterior) aneurysm had a narrow orifice opposite the perforation in the left cusp—that is, in the extreme anterior part of the sinus; it extended for about 1.5 cm. to the left beneath the undilated part of the sinus. The larger (posterior) aneurysm involved an area about 1.5 cm. in diameter, and was situated in the most posterior quarter of the sinus; it extended posteriorly, upwards, and to right and left for about 1 cm. Externally its bulging upper dome could be seen between the aorta and the left auricle. The smooth walls of these aneurysms and the presence of the congenital bicuspid valve suggested at first that they might be congenital in origin. There is, however, no recorded case of a congenital aneurysm of the left aortic sinus, presumably because its formation is not affected by the aorto-pulmonary septum. Furthermore, when the posterior aneurysm was investigated microscopically by studying serial horizontal sections at 1-mm. intervals, it was found to have a smooth uninflamed fibrous wall 2 to 3 mm. thick, containing peripherally numerous histiocytes filled with iron pigment. It was continuous below with the fibrous tissue of the annulus fibrosus; at the sides and above the elastic tissue of the aortic media was bent outwards before abruptly giving place to the fibrous tissue of the aneurysm wall. If the aneurysms were congenital, one would expect at least the upper part to be lined by elastic-containing media, even if the lower part were lined by fibrous tissue from the annulus fibrosus.

The blood reaching the pericardial cavity had burst through a small hole in the left wall of the posterior aneurysm and emerged between the left auricular appendage and the aorta, tracking for about 0.5 cm. beneath the visceral pericardium. Microscopically this hole was an acute inflammatory sinus, but serial sections taken above and below it showed a closed cavity filled with pus cells in the wall of the aneurysm (see Fig. 3). This suggests that

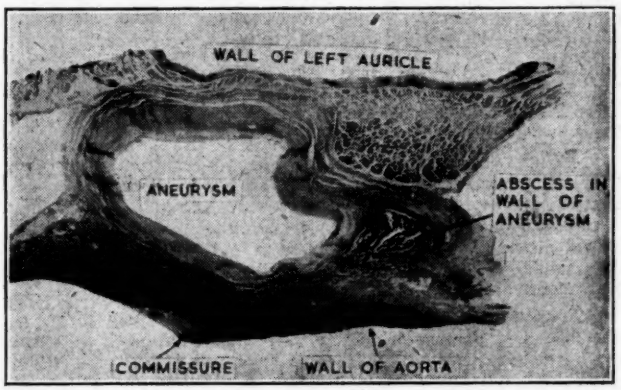

FIG. 3.—Transverse section through posterior wall of aorta and upper part of posterior aneurysm at level of top of aortic valve. (×2½. Verhoeff's elastica.)

the perforation was not due to inflammation of the inner surface of the aneurysm but to an abscess in the wall, which may have been embolic in origin or, more probably, arose by direct spread from the vegetations near the attachment of the left cusp.

Other Organs.—The lungs were oedematous (right 800 g., left 550 g.), and there were bilateral pleural effusions, each about 200 ml. The spleen (500 g.), liver (1,800 g.) and lymph nodes were all congested. Microscopically they contained scattered collections of inflammatory cells and small granulomata consisting of epithelioid cells with a varying amount of collagen and an occasional foreign body giant cell but no central caseation. The kidneys, normal in size, had microscopically a non-specific interstitial inflammatory reaction. The remaining organs showed no unusual features.

Bacteriological Findings.—*Br. abortus* was isolated from the patient's bone marrow, and also by guinea-pig inoculation from part of an aortic-valve vegetation which had been washed repeatedly in sterile saline and 70% alcohol and ground before injection into the animal. (The guinea-pig's serum agglutinin titre to *Br. abortus* rose to 1 in 320 in five weeks.) The cultures of *Br. abortus* were identified by their nutritional requirements, and by biochemical tests, dye inhibition tests, and serology. This confirmed the diagnosis of *Br. abortus* carditis and septicaemia.

Comment

Of the 22 cases of *Brucella* endocarditis confirmed at necropsy, 14 were due to *Br. abortus*, the organism causing undulant fever in Great Britain. In addition to the case described by Hart *et al.* in this country, 10 cases have been recorded in America (Scott and Saphir, 1928; Spink and Nelson, 1939; Smith and Curtis, 1939; Spink *et al.*, 1942, 1948; Wechsler and Gustafson, 1942; Call *et al.*, 1944; Quintin and Stalker, 1946; Voth, 1949), and three in Central Europe (Matzdorff, 1933; Steyrer, 1934; Rothman, 1935). All were males, reflecting the curiously high incidence of brucellosis in men (Stableforth, 1952), and all died after an illness lasting 3 to 11 months. One case of recovery has been described (Spink *et al.*, 1948).

Although in at least two cases (Rothman, 1935; Spink and Nelson, 1939) the heart valves attacked were apparently normal, the infection resembles *Streptococcus viridans*

endocarditis in usually seeking out valves which have been previously damaged by rheumatism or which are congenitally deformed. In nearly all the recorded cases, including the two previously described in England, old rheumatic valvulitis has been found. Our case is the fourth example of infection superimposed upon a congenital bicuspid aortic valve (Wechsler and Gustafson, 1942; Voth, 1949; Spink *et al.*, 1948).

Cases of bacterial endocarditis due to *Brucella* organisms have certain distinctive characteristics. These are well illustrated by our case, and may be summarized as follows:

1. The aortic valve is usually attacked. Occasionally the mitral valve is also involved, but in only two cases was the disease confined to it (Rennie and Young, 1936; Spink *et al.*, 1942).

2. There is a great tendency to produce ulceration. The valve cusps become perforated and there are often haematomata in the myocardium or in the auricular or ventricular septa. In the first case described by Call *et al.* (1944) the inflammatory process had ulcerated through the root of the aorta as far as the epicardium, but, unlike our case, rupture into the pericardium had evidently not occurred.

3. Aneurysmal dilatation of the aortic sinuses is common. Probably (see Jones and Langley, 1949) inflammation of the sinus wall causes separation of the annulus fibrosus from the aortic media, so that blood passes through the wall of the aorta and stretches the exposed muscle of atrium or septum. It then clots and eventually becomes organized, so giving rise to an aneurysm lined by fibrous tissue. That this is the correct explanation in our case is supported by the presence of the surrounding histiocytes filled with iron pigment.

4. A persistent leucopenia is common, but, unlike uncomplicated brucellosis, there is a relative neutrophilia rather than a lymphocytosis, apart from one exception (Steyrer, 1934).

5. Extremely low blood pressure, which was a prominent feature in this case—the systolic pressure being only once recorded as above 100 mm.—has also been found in other cases. In one of these (Gounelle and Warter, 1935) a pressure of 60/45 was recorded, and five others had pressures of 105 mm. systolic or less at one time or another. Furthermore, evidence of alteration in conduction of the heart muscle has been demonstrated in several cases, although not in ours. Both these factors may well be due to the severe myocarditis commonly present.

6. The accompanying bacteriaemia often gives rise to a variety of focal lesions in the viscera, such as the granulomata, suppurative lesions, and focal necroses seen in our case (compare Matzdorff, 1933; Sprunt and McBryde, 1936; Rabson, 1939; Call *et al.*, 1944) as well as embolic lesions.

7. There may be improvement in symptoms and cessation of pyrexia for a period, even when infection remains active (Call *et al.*, 1944; Voth, 1949; Hart *et al.*, 1951), so that a patient with *Brucella* endocarditis may appear deceptively well—an important practical point, well illustrated by our case. There was little evidence of septicaemia, only slight pyrexia, no definite embolic manifestations, and no clinical enlargement of the spleen, at a time when the histological evidence suggests that the endocarditis was progressing.

The possibility of such rare complications reinforces the need for the early diagnosis of all cases of undulant fever and their treatment with full courses of antibiotics.

Summary

A case of *Brucella* endocarditis is reported. It was superimposed on a congenital bicuspid aortic valve and gave rise to aneurysms of the aortic sinuses. Terminal rupture of the heart resulted from a small abscess in the wall of one of these aneurysms.

The characteristics of this type of endocarditis are described in the light of this and previous cases.

The possibility of such a serious latent complication emphasizes the need for early diagnosis and treatment of all cases of brucellosis.

We wish to thank Dr. A. C. Jones and Mr. P. Everall for the bacteriological work in this case, and Mr. R. T. Ross for technical assistance.

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OBSERVATIONS ON GOLD THERAPY IN RHEUMATOID ARTHRITIS

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Gold salts have been widely used for the treatment of rheumatoid arthritis for about 20 years, and during that time many reports of the results have been published. Although some of these reports have been of small numbers of cases, others have been extensive; for example, Forestier (1935) reported on over 550 treated patients, and Hartfall *et al.* (1937) on 690. The general impression from these reports is that a favourable response may be expected in about 80% of cases. Thus Short *et al.* (1946) analysed the results of gold treatment in cases collected from 35 published reports. Making allowance for the different criteria adopted, they found that it was claimed that 84% of 1,943 cases showed definite improvement of any degree, 59.3% of 2,924 showed noteworthy improvement, and 22.6% of 1,825 were arrested. It is probably true to say that on this basis gold has become the most widely accepted single therapeutic weapon in the treatment of rheumatoid arthritis.

Need for Controlled Trials

Unfortunately, none of the results in the early series were controlled in any way, and even now the number of reports of controlled series is strikingly few. Control of results in rheumatoid arthritis is essential for two reasons. The first is that spontaneous improvement and arrest can occur at any time; it seems to occur more often in patients who have developed the disease at an earlier age and in earlier stages of the disease, and it is notable that it is for such patients that gold is said to give the best results. The exact course and the natural history of untreated rheumatoid arthritis are difficult to assess, as with such a prolonged and disabling condition it is impossible to keep patients entirely without treatment, either from their doctor or from friends. Few figures are available even for the results of simple and non-specific treatment, but Short *et al.* (1946)

assessed such results for 274 patients in 1937, after a period of six months to seven years. They found 52.9% with noteworthy improvement and 16.4% in which the condition was arrested. In a later paper (Short and Bauer, 1948), covering 250 cases followed for a further 10 years, 53.2% were found to be improved and 15.9% in remission, with 9% arrested for five years or longer. They did not consider that their own results for gold treatment in 35 patients were any better than this. They quote Furlong (1942) for the opinion that 60–70% of patients receiving general measures show improvement. Thompson *et al.* (1938) also claimed that various measures other than gold resulted in marked or moderate improvement in 76.5% of 274 patients, with 6% classified as being well.

The second difficulty in assessing results lies in the determination of objective improvement. In 1937 Hartfall *et al.* stated that they had been unable to eliminate the psychological effect of injection therapy, but thought that "most observers will no doubt agree that psychogenic factors do not play an important role in the majority of patients." In recent years the effect of the emotional state of the patient and of the emotional atmosphere on subjective tests of improvement has been increasingly noted. Clark (1951) has stressed the effect of placebo treatment, and Bedford (1951) has shown that the response to subjective tests may vary from hour to hour even in the absence of any therapy. There is as yet, however, no agreement on which tests may be considered objective. Quin *et al.* (1950) accept tenderness, power of grip, and speed of movement as suitable tests, and Janus (1950) accepts tenderness and grip. As Clark has pointed out, these tests depend on the co-operation of the patient, and changes in the emotional tone may, by varying the threshold of sensitivity to pain, cause variations in the results obtained. Strictly objective tests that may be used include the measurement of joint size, temperature, and blood flow; estimation of the E.S.R. and degree of anaemia; and estimation of plasma viscosity and C-reactive globulin. The difficulty of using many of these tests in routine assessment of improvement is obvious.

Results in the Literature

The first report of a controlled trial of gold salts was by Ellman *et al.* (1940). They treated 30 patients with large doses of gold salts and 30 with small doses; 30 patients were observed as controls. They claimed that in 14 of those on large doses, 8 on small doses, and 1 of the controls became inactive, and that 14, 20, and 22 respectively showed some improvement. These findings were supported by E.S.R. estimation and measurement of joint swelling. After one year the results in the treated cases remained better than in the controls.

Fraser (1945) carried out a carefully controlled investigation on 110 patients, 61 being treated with sodium aurothiomalate ("myocrisin") and 49 with control injections. The results were assessed after one year. He found that 82% of those on gold improved clinically, compared with 45% of the controls, although 75% of the latter claimed subjective improvement. He did not claim arrest in any cases, but 56% of those on gold were considered to show great improvement, compared with 33% of the controls. Fraser believed that, although gold was the best single form of treatment available at the time, the good results claimed by the majority of observers were unjustifiably high owing to the lack of adequate controls.

Waine *et al.* (1947) are quoted by Egelius *et al.* (1952) as having treated 58 of 120 patients with gold. After an average of 2.9 years they found 56.9% of the treated cases symptom-free or greatly improved, compared with 29.1% of those treated physically.

Adams and Cecil (1950) treated 106 of 189 patients with gold. After one year they claimed complete remission in 78.7% of cases on gold and in 29.8% of controls for cases of less than six months' duration, while in those in which the disease was present for a longer period remissions occurred in 48.9% and 16.7% respectively. After an average of four years, 55.7% of gold cases and 36.1% of controls remained in remission. These figures are high for cases showing complete inactivation; by using the strict "therapeutic criteria" of the New York Rheumatism Association (Steinbrocker *et al.*, 1949) they are lowered to 44.8% for gold and 27.7% for controls; such figures indicate how varying criteria may affect the results obtained in uncontrolled series.

Merliss *et al.* (1951) treated 28 patients with aurothioglycoanilide ("lauron") and 44 controls with saline, serum, or antireticulocytotoxic serum. They found no essential difference in the results of the two groups, and again stressed the great variation of results with a varying emotional atmosphere.

The introduction of cortisone has shown what effect can be achieved by a really potent remedy in suitable cases of rheumatoid arthritis, and has given a standard against which the results of gold therapy can be set. Since it is widely agreed that gold may produce dangerous toxic effects, it is essential to be sure that any benefit obtained is great enough to warrant its continued use. Gold treatment will not necessarily be discarded completely through the introduction of cortisone, and indeed its use to potentiate or prolong the action of cortisone is under investigation. In these circumstances, and considering the varying results reported, it seems essential that further controlled studies of the results of treatment should be carried out.

Present Investigation

A course of treatment lasting 13 weeks was given to 220 patients. All were treated in the out-patient department of the Glasgow Royal Infirmary and were seen once weekly for treatment and observation. The diagnosis of rheumatoid arthritis was based on the following criteria: polyarthritis; radiological confirmation or lack of evidence of other joint pathology; normal blood uric acid; negative Wassermann reaction; negative gonococcal complement-fixation test; negative serum agglutination test for abortus fever; acceptable clinical history and picture; and raised E.S.R. and raised plasma viscosity. The patients were assessed for improvement at the end of the course, again three months later, and, finally, one year after treatment had ceased. Assessment of subjective improvement was by pain, performance, well-being, and appetite; objective improvement by joint measurements, E.S.R., plasma viscosity, and degree of anaemia.

Treatment was as follows:—(1) Gold: weekly intramuscular injections of sodium aurothiomalate (total dose 0.8–1 g., divided over 13 doses). (2) Copper: weekly intravenous injection of "cuprelone" (1st dose, 10 mg.; 2nd and 3rd doses, 25 mg.; 4th and 5th doses, 50 mg.; 6th and 7th doses, 75 mg.; 8th and 9th doses, 100 mg.; 10th and 11th doses, 150 mg.; 12th and 13th doses, 200 mg.). (3) Saline: weekly intramuscular injections of 3 ml. of sterile normal saline. (4) Physiotherapy: weekly treatments of various forms of heat therapy and gentle massage. (5) Arsenic: weekly intravenous injections of neoarsphenamine (1st dose, 0.15 g.; 2nd to 13th doses, 0.3 g.). (6) Aspirin: 10 gr. (0.6 g.) acetylsalicylic acid powder three times a day for 13 weeks; interviewed weekly.

The results at the end of the course for all patients are set out in Table I. These results are not, however, strictly comparable one with another, as the cases treated by gold and

TABLE I.—*Results at End of Course; All Cases*

Treatment	No. of Cases	% Symptomatically Improved	% Objectively Improved
Gold	38	75	50
Copper	60	50	33
Saline	60	42	33
Arsenic	21	70	50
Physiotherapy ..	22	50	33
Aspirin	19	50	25

arsenic had been selected in that they were all early and frankly active cases with an E.S.R. of over 40 mm. in one hour. The remaining groups included patients over 50 years of age and with advanced disease.

Table II shows the results adjusted by the removal of such patients from each group. The figures in this small series indicate that the results of a single course of treatment with gold salts are no better than those obtained by the other methods described.

TABLE II.—*Results Adjusted to Exclude Elderly and Inactive Cases*

Treatment	No. of Cases	At End of Course		At 3 Months		At 1 Year	
		A	B	A	B	A	B
Gold ..	38 (0)	75	50	62	28	53	30
Copper	40 (20)	77	52	66	32	50	33
Saline..	38 (22)	74	53	60	36	55	30
Arsenic	21 (0)	70	50	60	30	50	29
Physiotherapy	16 (6)	70	43	58	29	48	30
Aspirin	13 (6)	77	38	59	25	60	25

A=Percentage symptomatically improved. B=Percentage objectively improved.
Figures in parentheses show the number of cases eliminated from each group to make the basis for selection comparable to that for gold therapy.

Summary

Attention is drawn once more to the small number of reports of controlled trials of gold therapy and to the variation in the results obtained.

A series of 220 patients have been treated by a variety of measures, 38 of them receiving gold. No appreciable difference in the results has been found, either immediately or after one year.

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Miss Patricia Hornsby-Smith, M.P., Parliamentary Secretary to the Ministry of Health, was the guest speaker at the annual general meeting of the Central Council for the Care of Cripples, which took place on April 10. She said she sympathized very much with the point of view of the council on the edict of the General Nursing Council preventing nurses from starting their training until they are 18, and thus eliminating the year of orthopaedic pre-nursing which many girls of 17 had been doing, but she hoped that some compromise might yet be reached in this matter. The Ministry of Health readily acknowledged and appreciated the voluntary work which the council was doing, and was glad to support the project being launched for the sale of goods made by cripples. A committee was being set up by the Ministry to inquire into the rehabilitation and training of all those physically handicapped. Miss Hornsby-Smith said that, following a circular to 129 local authorities asking them to submit schemes for the care of their physically disabled, 65 had already submitted schemes to the Minister. She thought local authorities had a difficult task in deciding which service to expand and which to create without increasing the rates.

DISSEMINATED ASPERGILLOSIS AND MONILIASIS ASSOCIATED WITH AGRANULOCYTOSIS AND ANTIBIOTIC THERAPY

BY

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Pulmonary aspergillosis and local infections with monilia are not rare, but the disseminated forms are much less common. The use of antibiotics in the presence of these fungous infections is dangerous. The following case is of interest because both fungi were present in the lesions.

Case Report

A window cleaner aged 45 was seen on April 3, 1951, with an abscess of the thigh. He was treated with sulphonamides, and was admitted on April 18 for evacuation of the pus (culture, *Staphylococcus aureus*). He later developed consolidation of the right lung. This was treated with penicillin, 14 million units, and resolved slowly. Albuminuria developed on May 28 and persisted. The white-cell counts on April 26 and July 26 were 4,600 and 4,300 per c.mm., respectively. He was discharged on August 31, and shortly afterwards developed ulceration of the throat, which responded to chloramphenicol. He was readmitted on October 5 and agranulocytosis was found (white cells 1,800, polymorphonuclears 108 per c.mm.), and this persisted. Chloramphenicol was continued (total dose, 30 g.), with oral and intramuscular penicillin. Pyridoxine, 250 mg., "Ivadex" 20 ml., and three blood transfusions of 1 pint (570 ml.) were given. Consolidation of both lungs developed on November 1 (sputum culture, *Ps. pyocyanea*) and he died on November 7.

At necropsy on November 8 fibrinous pleurisy was present on both sides. A large infarct was found in the right upper lobe and a smaller infarct in the middle lobe; the pulmonary arteries to these areas showed thrombosis. In the left upper lobe was a pale area of consolidation 6 cm. in diameter, but no cavitation. A typical red infarct was present in the left kidney, and both kidneys showed several smaller dark-red areas in the cortex. The liver was enlarged (3,500 g.), pale, and firm, with numerous firm white nodules up to 1.5 cm. in diameter with some hyperaemia at the edges. There were a few similar areas in the spleen. The oesophagus was covered throughout with a ragged soft membranous exudate covering shallow ulcers. There was one small acute ulcer in the stomach. In the duodenum and jejunum there were numerous ulcers up to 1 cm. in diameter with a yellowish base and raised haemorrhagic border. A few ulcers were found in the ileum and one in the caecum. Red marrow was present in the sternum and vertebral bodies. Exploration of the left thigh showed fibrosis at the site of the abscess, but no pus or involvement of the femur.

Sections of the lesion in the left lung showed a central area of necrosis, in which only the outlines of the blood vessels could be distinguished. Surrounding this was a zone of inflammatory infiltration in which plasma cells and macrophages predominated. No polymorphonuclears or eosinophils could be seen. Branching mycelium was present throughout the necrotic zone, invading the inflammatory zone and large and small vessels at the edge. The left lung showed a typical infarct with mycelium in the thrombi. The kidney contained an infarct with mycelium in the lumen of the artery. Sections of liver and spleen revealed areas of necrosis similar to that in the lung, but with a very dense network of mycelium, which extended on to the peritoneal surface of the liver. The ulcers in the alimentary tract showed necrotic centres surrounded by the inflammatory reaction, and invasion of the muscularis and blood vessels by mycelium.

Dr. J. T. Duncan kindly examined the sections and made the following comments on the morphology of the fungi. "The tissue sections showed infection by two different fungi, neither of which can be identified specifically without a culture. One of the fungi shows a coarse septate mycelium bearing tufts of stunted terminal branches, indistinguishable from the vegetative mycelium of *Aspergillus fumigatus* in parasitic life, yet not sufficiently distinctive to be identified with this species in the absence of conidial apparatus. This was the only fungus seen in the lung and kidney sections, but it was present also in other tissues, often within the blood vessels. In fact, like *A. fumigatus*, it seemed to have a marked predilection for the blood vessels, and this accounts for the renal infarct. I would judge that this mould infection originated in the lung and was carried to other organs by the blood stream. The other fungus, which was seen in all of the tissues except the lung and kidney, showed general morphology of *Candida*, which is particularly well shown in the sections of liver and spleen. In many of the tissues both fungi are present, and in some areas they are intimately mixed. However, the *Candida* infection is chiefly associated with the mucosa of the alimentary tract."

Discussion

Disseminated aspergillosis is often associated with infarcts, especially in the kidney (Wahl and Erickson, 1928; Abbott *et al.*, 1952; Dr. H. G. Close, personal communication). Very widespread dissemination has been described (Cawley, 1947; Grekin *et al.*, 1950), as have two cases of endocarditis (Zimmerman, 1950). Infection of the mouth and alimentary tract with monilia is a common complication of agranulocytosis. Several cases of disseminated infection have been described. The portal of entry may be the alimentary tract, as in the present case and in those of Lederer and Todd (1949). Duhig and Mead (1951) discussed the possibility of introduction into the blood stream during intravenous therapy. This probably occurred in the cases described by Joachim and Polayes (1940) and Wikler *et al.* (1942) in drug addicts, and by Geiger *et al.* (1945). The bacterial flora of the alimentary tract is known to change during antibiotic therapy, and fungi often appear (Tomaszewski, 1951) owing to suppression of the normal flora and other factors. It is probable that in the present case dissemination of the fungi was promoted by chloramphenicol therapy. The association of agranulocytosis with chloramphenicol was not well known at the time this patient was treated.

Summary

A case of fatal generalized aspergillosis and moniliasis is described. The patient's illness started with a staphylococcal abscess in the thigh, followed by pyaemia with lung lesions. He later developed agranulocytosis and was treated with chloramphenicol. Recent reports indicate the danger of this drug in agranulocytosis. Aspergillosis and moniliasis were found at necropsy. Reference is made to other cases of generalized fungous infections in the literature.

I wish to thank Mr. P. M. Birks and Dr. R. F. Jarrett for permission to publish this case; Dr. E. N. Davey for his advice in preparing this paper; and Dr. H. G. Close, of Dartford, for allowing me to examine material from his case. Dr. J. T. Duncan's help and advice on the mycology have been invaluable. I am grateful to Miss B. Summers for the histological preparations.

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Medical Memoranda

Monilia Peritonitis

Powerful wide-spectrum antibiotics will suppress the growth of susceptible bacteria, and these may be replaced by monilia or other yeast-like organisms which can in certain situations become pathogenic. Oral and intestinal lesions are well recognized (Woods *et al.*, 1951), and cases of monilia pneumonia (Ormerod and Friedmann, 1951; Wolff, 1952) and moniliasis of the urinary tract (Taylor and Rundle, 1952) have been reported in patients treated with aureomycin or chloramphenicol. So far as we know monilia peritonitis has not hitherto been reported.

Case Report

A man aged 49 was admitted to hospital with foot-drop, fever, and abdominal pain. While in hospital the fever continued, wrist-drop developed, and signs of active carditis appeared. The usual investigations of a pyrexia of unknown origin were negative, and in spite of parenteral penicillin the patient deteriorated and developed bronchopneumonia. He was thought to be suffering from polyarteritis nodosa, and, although he was known to have a duodenal ulcer, it was decided that he should be treated with 100 mg. of A.C.T.H. and 2 g. of aureomycin daily. After three days on this regimen he complained of severe abdominal pain and his abdomen became distended with fluid. He was judged unfit for surgical intervention and 60 oz. (1.7 litres) of brownish viscid fluid was aspirated from the peritoneal cavity. The A.C.T.H. was stopped, the stomach aspirated, and an intravenous drip of glucose–saline begun together with intravenous terramycin. Three days later a further paracentesis was necessary and 100 oz. (2.8 litres) of very viscous fluid was withdrawn.

Large numbers of monilia were found on direct examination of the fluid, with pus cells but no other organisms, and a pure growth of *Candida albicans* was obtained on culture. Gentian violet, 1 g., was given daily by intraperitoneal injection, but fluid continued to reaccumulate and the patient went downhill and died after a further four days. At necropsy 3 litres of fluid was found in the peritoneal cavity, the viscera were coated with fibrino-purulent material, and there was a large perforated ulcer in the first part of the duodenum.

Comment

The aureomycin must have altered the patient's intestinal flora until *C. albicans* was the dominant organism, and when the ulcer perforated as a complication of treatment with A.C.T.H. it was this organism which obtained access to the peritoneal cavity and set up infection. Powerful new remedies of necessity bring with them new complications, and it is important that these should be recorded, as, with the increasing use of these agents, similar cases are to be expected in the future.

We are grateful to Dr. R. L. Vollum for the bacteriological findings and to Professor L. J. Witts for permission to publish this report.

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Congenital Hypertrophic Pyloric Stenosis in Twins

When a disease process of uncertain cause affects one or both of twins speculation is immediately aroused whether hereditary influences, maternal toxins, placental abnormalities, and the like may have some bearing on the causation. The present paper records the occurrence of congenital hypertrophic pyloric stenosis in both members of a pair of identical twins.

CASE REPORT

Richard and Joseph were born on September 16, 1950, in hospital. There was another child, aged 7, alive and well. The mother's age was 25; her general health was good, her diet was satisfactory, and she had had no miscarriages. There was no history of infection during pregnancy nor a family history of twinning or congenital abnormality. She was admitted to hospital two weeks before delivery because her blood pressure was raised, and she was stated to have toxaemia. Both babies were born spontaneously, both at full term. Joseph was born first, and weighed 6 lb. 11 oz. (3,033 g.); Richard weighed 6 lb. 10 oz. (3,005 g.). The placenta weighed 2 lb. 13 oz. (1,276 g.), and was uniovular.

Both twins were breast-fed, but they needed occasional complementary feeds. They took feeds quite well until October 6 (3 weeks old), when they both began to vomit. This vomiting was at first slight, but it soon became projectile in character. The feeding was changed to mainly a half-cream proprietary milk food, but after some relief the vomiting became projectile again. Breast-feeding was not completely stopped, however. The babies were constipated and always hungry. Visible peristalsis was observed in a child welfare clinic, and the babies were admitted to hospital on October 10.

On admission Joseph weighed 7 lb. 12 oz. (3,515 g.). He was well developed and showed no signs of dehydration. Visible gastric peristalsis was observed, and a typical pyloric tumour was palpated on October 11. He had been given treatment with glucose–saline and an antispasmodic. There was some relief from vomiting, but this recommenced early on October 12. Richard weighed 6 lb. 4 oz. (2,835 g.), and was a little dehydrated. As with Joseph, visible gastric peristalsis was seen and a tumour palpated. Under treatment he gained 6 oz. (170 g.). On October 12 he started to vomit again. It was therefore decided to submit both twins to operation. Joseph was operated on first. Typical pyloric tumours were found in each case, and Fredet–Ramstedt operations were performed.

Joseph had occasional vomits post-operatively, and on the third day after operation he had three large vomits. The stomach was washed out with saline and a large quantity of mucus was removed. His vomiting ceased, his bowels functioned normally, and he began to gain weight. Richard's convalescence was complicated by incessant vomiting. Stomach wash-outs relieved him only a little. Both babies were being fed with expressed breast milk with complementary feeds of half-cream dried milk. It was noted that Richard's vomits were associated with the dried-milk feeds. He was therefore fed wholly on "bank" breast milk. He then ceased to vomit and began to put on weight. Joseph was discharged on October 17 and weighed 7 lb. 10 oz. (3,460 g.). Richard weighed 6 lb. 12 oz. (3,060 g.) when he was discharged on October 23. After discharge the mother fed Richard mainly on the breast, but within a few weeks both were having breast milk and complementary feeds. They were last seen on April 19, 1951, and were then being fed on breast milk and solids. Each weighed 16 lb. 9 oz. (7,510 g.). They looked very alike, having the same features, and hair and eyes of the same colour.

COMMENT

The occurrence of the same disease in twins at the same time is always an interesting phenomenon. When the disease is one such as congenital hypertrophic pyloric stenosis this interest is heightened. Moore (1924) seems to have been the first to report pyloric stenosis affecting both members of uniovular twins. Since then the number of reported cases has not been large. Laubscher and Smith (1947) collected 13 such reports. Wagner and Baratz (1951) and Lamy and his co-authors (1949) have since added one case each.

The suspicion that a genetic factor plays an important part in the aetiology of congenital hypertrophic pyloric stenosis is substantiated by the increasing number of reports of its occurrence in twins, siblings, and near and distant relatives. Cockayne (1934) has propounded the view that the disease has a genetic basis, but adds that "the way in which the condition is inherited is still uncertain, and an environmental factor may be necessary for its production, in addition to the genetic one." Sheldon's (1938) thoughts on the subject, that "when pyloric stenosis affects uniovular twins both twins show the condition," and "when pyloric stenosis affects binovular twins the disease is likely to occur only in one twin," are in the main true, and reports such as this and those of Ward-McQuaid and Porritt (1950) and of Cockayne and Penrose (1943) add further support to his views. There are, however, exceptions to this, as amply shown by Lasch (1925), O'Donnell and Klein (1941), Laubscher and Smith (1947), Hughes, Small, and Macky (1949), Garrison (1949), Powell and Carter (1951), and Sheldon himself. All these writers have given instances of pyloric stenosis affecting both members of binovular twins. Conversely, Sheldon, Powell and Carter, and Lasch have reported only one member of uniovular twins being affected.

In this report the type of twinning has not been so completely elucidated as were the cases reported by Ford, Brown, and McCreary (1941). The evidence available points to the twinning being uniovular. The fact that there was one placenta, the obstetrician's opinion that the placenta was uniovular, the similarity in sex, the striking likeness in features, colour of hair, eyes, and complexion, and their general progress are strong pointers to the conclusion that these babies are monozygotic twins. Thus the occurrence of congenital hypertrophic pyloric stenosis in them affords further evidence to substantiate Sheldon's assertion. However, there are so many exceptions, and the number of cases involved is so small, that the truth of the matter cannot yet be correctly assessed.

My thanks are due to Mr. W. A. Thompson for his kind permission to treat these patients and to publish this case report. The babies were admitted under his care to the Royal Liverpool Children's Hospital.

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The Court of the University of Edinburgh has appointed Miss G. B. Carter, B.Sc., S.C.M., S.R.N., to the Boots Research Fellowship in Nursing tenable in the Department of Social Medicine. Miss Carter, during her tenure of the Fellowship, is to undertake (*a*) a review of the educational needs of the sister tutor in relation to her responsibilities; (*b*) an examination of the courses of instruction offered in Great Britain to the candidates for the sister tutor's certificate; and (*c*) an examination of the desirability and of the possibility of instituting in this country an academic degree in nursing which would be of advantage to such as hold senior positions within the nursing profession.

Reviews

SYMPATHETIC CONTROL OF BLOOD VESSELS

Sympathetic Control of Human Blood Vessels. By Professor H. Barcroft, M.D., M.R.C.P., and H. J. C. Swan, M.B., B.S., M.R.C.P. Monographs of the Physiological Society, No. 1. (Pp. 165; illustrated. 18s.) London: Edward Arnold and Co. 1953.

This monograph is the first of a series started by the Physiological Society under the editorship of Drs. Bayliss, Feldberg, and Hodgkin, whose names guarantee a high standard of quality. It is an excellent opening number and a good omen for its successors.

There are two types of monograph, each distinctive, each useful to the reader, and each, according to its content and authorship, authoritative within its field. The first is a survey of the whole ground embraced by the title, the second is the record of a voyage indicating the problems seen, the thoughts, experiments, failures, and successes; it carries the reader in the spirit of adventure and, when well written, holds him with radar eyes even though viewing through a sea mist or a Celtic twilight. This is of the second type. Of the monograph writers in this class, among the best was the father of the senior author of this work. It is with nostalgic pleasure one is taken into the author's confidence, one sees the design of the experiment being built up, one watches colleague-collaborator achieve his answer, and, that problem disposed of, one follows through to the next step, sharing the experimenters' *joie de vivre*.

This method has the virtue of joining with the authors in their Odyssey, but it has the weakness that one only visits the islands Ulysses visited. One would have liked to know the position of the work of Paton and Zaimis and the hexamethonium drugs in this picture—especially as Fig 10.2 tantalizingly refers to this group, but in the text of the book they are not mentioned. In many respects the most useful and also the most interesting portions are the accounts of the experimental methods designed and followed in settling the relative functions of neural and humoral factors. The logical processes pursued hold the interest. The appendix on plethysmography is a useful account of the history of the subject, and the authors discuss the technique and methods in a way invaluable for the non-physiologist or the honours student. Two clinical conditions are most illuminatingly considered—phaeochromocytomata and fainting—and well illustrate the value of the experimental method in clinical problems. The illustrations are plentiful and useful though compact. So far as the reviewer knows, the answer to Professor Barcroft and Dr. Swan's question on p. 143–4 ("Where did Brodie and Russell do their experiments?") is, In Professor Barcroft's own laboratory, where Brodie was head and Russell demonstrator.

A. ST. G. HUGGETT.

VISCERAL CIRCULATION

Visceral Circulation. A Ciba Foundation Symposium. Edited for the Ciba Foundation by G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch., assisted by Margaret P. Cameron, M.A., A.B.L.S., and Jessie S. Freeman, M.B., B.S., D.P.H. (Pp. 278; 72 illustrations. £1 10s.) London: J. and A. Churchill. 1952

This is the text of a symposium on the visceral circulation which was held at the Ciba Foundation in London in July, 1951. The first part is on the architecture of the visceral circulation, of which so many beautiful pictures have been produced in recent years, and where arterio-venous shunts and pre-capillary sphincters are the topics of the day. The second part is on general factors in blood-flow regulation, with particular reference to the actions of adrenaline and *nor*adrenaline. The third part is on regional blood-flow regulation, the investigation of which requires complex and arduous techniques, and the fourth and final part is on the interaction and integration of the general and visceral circulations.

As has happened in other fields, the study of the circulation has become not less but more complicated as more data have been collected, but it is in disorders of the visceral circulation that we may have to look for an explanation of the mechanism of some unsolved diseases, more especially diseases of the skin and the alimentary tract. The symposium is well edited and contains some excellent photographs; it will be a useful work of reference, not only for those attending the conference but for the large number of other workers in this field.

L. J. WITTS.

THORACIC SURGICAL MANAGEMENT

Thoracic Surgical Management. By J. R. Belcher, M.S., F.R.C.S., and I. W. B. Grant, M.D., M.R.C.P.Ed. Foreword by Sir Clement Price Thomas, K.C.V.O., F.R.C.S. (Pp. 196; 65 figures. 16s.) London: Baillière, Tindall and Cox. 1953.

The authors of this book, both men well versed and skilled in their subject, have set out to place their knowledge and experience at the disposal of others. They have achieved their purpose with commendable directness and economy of words, realizing that real insight and understanding on the part of the resident staff is imperative in the working of any successful thoracic team. The book will be no less valuable to the team's nurses and physiotherapists.

Because of the mechanics of the chest and heart, operative success or failure depends largely on scrupulous pre- and post-operative care. In no other branch of surgery is the strict training of resident medical and nursing staffs more important. An occluded bronchus, an uncontrolled thoracic-cage deficiency, a leaking bronchus after pulmonary resection, a sudden intrathoracic haemorrhage, or the appearance of cardiac irregularity, or other serious post-operative incident, may mean death to the patient unless correctly diagnosed and remedied at once.

In relating the cost of the book to the pockets of its readers, the authors have perhaps limited its practical value by the exclusion of *x*-ray pictures. This could be remedied in subsequent editions. Then too, since ideas on many procedures, especially in relation to tuberculosis, are changing, an indication of relative values would have been helpful. For instance, the minor operation of phrenic crush, so lightly undertaken perhaps with the expectation of recovery of function in six to twelve months' time, may so cripple a patient with already impaired respiratory function that, in the absence of regeneration, future major surgery may be made difficult or impossible.

The book is clearly printed and well illustrated. It is full of fundamental information and will prove invaluable to a large number of men and women both at home and abroad. Mr. Belcher and Dr. Grant deserve the warmest congratulations on having analysed in a small space knowledge hitherto handed on only by word of mouth and precept. They have pointed out many pitfalls into which the unwary may stumble only too easily. This compact volume is strongly recommended to all those interested in thoracic medicine and surgery.

DONALD BARLOW.

PSYCHIATRIC RESEARCH

Prospects in Psychiatric Research: Proceedings of the Oxford Conference of the Mental Health Research Fund, March, 1952. Edited by J. M. Tanner, M.D. (Pp. 197. £1 1s.) Oxford: Blackwell Scientific Publications. 1953.

This book is one of the most stimulating psychiatric publications in recent years. The newly formed Mental Health Research Fund collected together 50 research workers and clinicians, eminent in various fields of psychiatry, sociology, neuroanatomy, biochemistry, pharmacology, and the like, to discuss ignorance hampering advances in the treatment of mental illness and the most profitable lines of future research. We now have available the full transcript of their two days' discussion at Oxford, which was at the time the subject of a leading article in this *Journal* (March 29, 1952, p. 699).

Parts of such a book are bound to be better than others, but an extremely high standard is maintained throughout.

Professor Le Gros Clark's contribution is outstanding on the possibilities of research into various regions of the brain whose function is little understood. As the cutting of a few tracts in the prefrontal lobes has resulted in the discharge of so many incurable patients from mental hospitals, other tracts in the brain must soon be explored. Dr. Eliot Slater is refreshingly outspoken on genetic research, and diagnoses some of our present troubles as "too many people who know all the answers (and) have found the key to the universe." The need for more psychological and physiological work in animals is repeatedly emphasized. This book also contains a host of other problems for those trained in all branches of medicine.

Future generations are bound to be bewildered about why, in the presence of so much mental disorder and psychopathic crime, so little is now being done to finance and organize research to combat it. The book's introduction stresses the incalculable cost in terms of human suffering. This, however, may be partly due to suspicion about the amount of supposed "trick cycling" prevalent in this specialty. Anyhow, those having such abilities might still be useful if they learn from this book how to produce more genuine rabbits out of the ridiculously small financial research hat provided at the present time.

WILLIAM SARGANT.

NUTRITION AND HEALTH

Nutrition and Health. By Sir Robert McCarrison, C.I.E., M.A., M.D., D.Sc., LL.D., F.R.C.P., with a postscript by H. M. Sinclair, M.A., D.M., B.Sc. Being the Cantor Lectures to the Royal Society of Arts in 1936, together with two earlier Essays. (Pp. 125. 12s. 6d.) London: Faber and Faber. 1953.

Sir Robert McCarrison went to India at the age of 23 and spent 30 years in working on nutritional problems. He attained the rank of major-general in the Indian Medical Service, and founded the well-known Nutrition Research Laboratories at Coonoor. In 1936, some years after retiring from his duties in India, he gave a series of Cantor lectures on the influence of diet upon health before the Royal Society of Arts. From his vast experience in both clinical and laboratory work he concluded that perfectly constituted food is the greatest single factor in the acquisition and maintenance of good health. In support of this view he correlated the fine physique of the northern Indian races—Sikhs, Pathans, Mahrattas, and Hunza and Nepalese hillmen—with their good diet based on wheat, milk, and vegetables. In contrast the more southern Indian races, including the Bengali and Madrassi, who subsist mainly on rice, were greatly inferior both in their physique and in their resistance to disease.

Proof that diet was the deciding factor was obtained by feeding seven groups of rats on the foods of selected races. The animals given the diet eaten by Sikhs became large and healthy, and those given the other diets were graded in their growth and resistance to disease in the same order as had been found in their human counterparts. Thus the rats given the Madrassi diet came at the bottom of the list, with a growth rate of only about one-third that observed in the rats given the Sikh diet. From these investigations McCarrison concluded that in India faulty diet not only increases the liability to infections, such as tuberculosis, but also gives rise to minor manifestations of ill-health which cannot be given a diagnostic label. These less obvious manifestations of deficiency disease, in his opinion, may have vastly greater practical importance than more obvious but less common diseases such as scurvy, beriberi, and rickets.

The present book, which is well produced and illustrated, will serve a useful purpose in bringing home to the rising generation the lessons taught in the Cantor lectures. During the last 20 years, as Dr. Sinclair emphasizes, our knowledge of the science of nutrition has greatly expanded. We have even learnt some hard lessons in its practical application: during the relief of starving Holland expensive protein hydrolysates were eaten willingly only by lunatics. It still remains difficult, however, to disentangle the effects of nutrition from those of other factors which affect public health. When we attempt to decide how far imperfect food is responsible for ill-health in Britain and other European countries, the pioneer work of McCarrison at least indicates that all is not necessarily well because frank signs of deficiency are not immediately evident.

T. MOORE.

CARDIOVASCULAR DISEASES

Lehrbuch der Krankheiten des Herzens und der Blutstrombahn. By Professor Fritz Lange. (Pp. 631; 192 figures. M. 71.) Stuttgart: Ferdinand Enke. 1953.

It is interesting to see a textbook of the diseases of the heart and circulatory system by Professor Lange, for it is based on Romberg's book, the third edition of which the reviewer studied over thirty years ago. The present volume is probably a good indication of thought and practice in this subject in Germany to-day. One finds remarkable differences from the ideas fashionable in Britain. In the general section the part on the metabolism of the heart is very well done indeed and most interesting. It follows a good section on the dynamics of the heart. In the section on physical examination it is curious to learn that a percussion hammer and pleximeter are still used: this must surely shock some for whom the art of percussing the heart at all is almost extinct. It is curious to associate the anacrotic pulse with hypertension. Pulses, by the way, are given Latin names, but sometimes the Latin is wrong. Gallop rhythm, however, is hardly mentioned. In the chapter on infective endocarditis there are some very complicated diagrams which do not illuminate the subject. It is interesting to gather that there seems to have been a considerable increase in the incidence of this disease in Germany much in the same way as it increased in Britain in 1918. In the chapter on congenital heart disease the operation advised by Brock in this country is not mentioned.

In discussing infarction the author claims that one can distinguish the anterior infarct from the posterior by the type of symptoms produced, noting that a posterior infarct produces pain referred to the abdomen, whereas anterior ones are likely to cause acute oedema of the lungs or sudden death. In treatment one is surprised to see that leeches receive more space than venesection and that the vogue for bathing, once so popular in Germany, is still maintained. One wonders whether one should really consider "diuretin" before the mercurial diuretics in these times: these are recommended for administration either intramuscularly or intravenously, but no preference is suggested. There is a considerable section on disease of the arteries and of the veins, so that anatomically, at any rate, the whole of the circulation is fully discussed.

Some of the illustrations seem to be familiar, coming from a source in this and another country which is not acknowledged. The print is good and the variety of type helpful. The *x*-ray photographs are clear and the cardiograms satisfactory. Emphasis is laid on the effort-cardiogram in diagnosing angina pectoris.

In general this book seems somewhat old-fashioned and hardly emphasizes what in Britain would be considered important. It is, however, interesting to read the opinions of those with a different point of view.

TERENCE EAST.

Garrod, Batten, and Thursfield's *Diseases of Children*, the fifth edition of which is edited by Professor Alan Moncrieff and Dr. Philip Evans, includes a number of new sections on the causes of congenital malformation, endocrine disorders, the alimentary tract, congenital heart disease, and other subjects. The text has also been extensively revised. The illustrations have been as thoroughly revised as the text, and there are many new ones. The two volumes are paginated continuously, with an index at the end. They are published by Edward Arnold and Co. for £7. The 19th edition of B. N. Ghosh's *Pharmacology, Materia Medica and Therapeutics*, which incorporates new material, is published by Hilton and Co., Calcutta, for 30s. (London agents, H. K. Lewis and Co.).

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THE REPRESENTATIVE BODY

A series of articles on the constitution of the B.M.A. is brought to a close in this week's *Supplement* with an article by Dr. Alfred Cox on "The Jubilee of the Representative Meeting," the first of which was held in Swansea on July 28, 1903. Dr. Cox is the only surviving member of the Constitution Committee of 1900, and we are much indebted to one to whom the Association is so much indebted for this lively and interesting account, written with undiminished mental vigour at the age of 87 years. At the beginning of this century, Dr. Cox tells us, there was despair, resentment, and "even desperation," because of the abuses of contract medical practice and of the inertia of the ruling body of the B.M.A.—the Council. The reason for the inactivity of the Association was "that it was unable to do anything effective because under its constitution it had no means of voicing either the opinion of the profession as a whole or even of its own members, and no machinery by which it could have organized effective resistance." The stimulus to reform came in the shape of a letter to the *Journal* of September 16, 1899, in which Dr. Samuel Crawshaw, on behalf of the Manchester Medical Guild, announced the holding of a conference of "delegates from all associations of general practitioners in England and Wales."

The dominating force at this conference was Mr. (later Sir) Victor Horsley. Dr. (later Sir James) Smith Whitaker was its principal draughtsman and subsequently the first Medical Secretary of the Association. The third force was Dr. Alfred Cox, of Gateshead, who years later succeeded Smith Whitaker as the B.M.A.'s Medical Secretary. It was Dr. Cox's proposals that the conference embodied in the following epoch-making resolutions[1]:

"(1) That the present need in medical organization is concentration;

"(2) That the multiplication of associations other than those purely local is to be deprecated;

"(3) That the size, position, and wealth of the British Medical Association make it the most suitable national medical organization; and

"(4) That the efforts of all medico-ethical and similar associations and of the conference should be directed to the conversion of the British Medical Association into an energetic body really representative of the majority of the members of the profession."

Victor Horsley led the deputation from this conference which met the Council of the B.M.A. in Ipswich in the same year, the outcome being the Council's appointment of a Constitution Committee, whose crowning triumph was the first Representative Meeting in Swansea in July, 1903. Dr. Cox believes that, besides himself, there are only two or three other surviving members of this meeting. As the B.M.A. is meeting at Cardiff this year it is apposite to recall that Mr. (now Sir) Ewen Maclean was Chairman of the Representative Body during the struggle over the National Health Insurance Act in 1911, and was elected President of the Association in 1928. To these and many other notable figures in our history the Association owes a debt of deep gratitude, but in this Jubilee Year of constitution-making we hail in particular the work of Dr. Alfred Cox, Sir Victor Horsley, and Sir James Smith Whitaker.

A jubilee year is a time for commemoration and also for taking stock. Much has happened since 1903. There have been two medical revolutions—in 1911 with the passing of the National Health Insurance Act and in 1946 with the passing of the N.H.S. Act. With the first there appeared the first autonomous body within the B.M.A.—the Insurance Acts Committee and its associated Panel Conference. Since 1946 the autonomy of the I.A.C. has become vested in the General Medical Services Committee and its associated Conference of Local Medical Committees. The consultants followed suit in obtaining autonomy for the Central Consultants and Specialists Committee of the Association. Restlessness about the autonomous position of these two important bodies has found expression in a resolution of the Representative Body that their autonomous powers should be renewed each year. And anxiety about this position has been voiced in articles and correspondence on the constitution of the B.M.A. in recent issues of the *Supplement*. In his letter of March 21 Dr. Cox says, "The idea of autonomy inside a parliament is unusual and seems to me potentially dangerous." Dr. F. B. Winfield (*Supplement*, April 18, p. 139) believes that the power and efficiency of the Representative Body have been impaired by the autonomous bodies. Dr. Metcalfe Brown (*Supplement*, March 28, p. 81) considers that the dangers of autonomy are less than might appear, that "autonomy is incompatible with

[1] *History of the British Medical Association, 1832–1932*. Compiled by Ernest Muirhead Little, F.R.C.S. Published by the British Medical Association, 1932.

true unity," but that it should disappear gradually and by agreement and not by any revolutionary measure. What is fundamental is that the power of the two autonomous bodies should not lead to sectionalism within the profession, with a consequent conflict of interests. What is needed is integration of interests and efforts, and so unity in a profession whose real aims and objects should be, and indeed are, one. It was, no doubt, with this in mind that the Winchester Division in its important memorandum on the Representative Body (*Supplement*, February 28) advocates election to it of four members of the Central Consultants and Specialists Committee, four of the General Medical Services Committee, and four of the Public Health Committee. The R.B. is the Parliament of the profession and the policy-making body of the Association. Its powers in this respect must be maintained and not weakened, and there can be little doubt that in general the R.B. feels that its position in the constitution of the B.M.A. is not what it was.

The other big change in the B.M.A. since 1903 is its great increase in membership, an increase which has paralleled the increase in registration of doctors, and now more closely approximating to it. In 1903 there were about 36,000 doctors on the *Medical Register*, and membership of the B.M.A. was 18,000. At the beginning of 1952 the number of persons on the *Register* was 82,256 (including 2,036 foreign doctors); membership of the Association was just over 66,000. In an article commenting on the Winchester Memorandum (*Supplement*, March 7) figures were given showing the corresponding increase in the size of the R.B. The numbers appointed by the home constituencies were 210 in 1920, 278 in 1938, 360 in 1947, 425 in 1951: the possible number for this year is 448. If to this are added the overseas members (31), the public health members (4), Council members, the secretariat, and the Press the Winchester Division estimates that a hall is needed large enough to allow for 600 people to "move about comfortably." Such a great increase in size must affect the quality of the work done in the four days allotted to the R.B. at the Annual Meeting. Complaints about this have been made at the meeting itself and in the *Journal*. The matter has been debated in Council and in the R.B., and at Dublin last year the R.B. accepted the Council's recommendation that its numbers should not be reduced. In general it was felt that the educational value to those present outweighed disadvantages. But the Winchester proposals for a reduction in the size of the R.B. to 329 members is strongly supported by one of its founders, Dr. Cox, in a letter to the *Supplement* of March 21. "At present," he writes, "it seems more like a public meeting than a legislative body." It must be difficult for a Representative Body of its present size to have any feeling of unity and concentration of purpose. It might, too, be argued that the place for education in the work of the Association is at the periphery, in the meetings of the Branches and Divisions that go on throughout the year.

Increase in numbers must lead to diffuseness of debate and to what the Winchester memorandum calls "a lack of balance in the conduct of business." The memorandum also makes a criticism which is of great importance—namely, "The Representative Body is not *truly representative of the profession* in that the majority of its members are general practitioners, so that the view expressed by the Representative Body on any subject tends to be the general practitioners' view, *and is unfortunately so regarded by other sections of the profession.* Consequently the decisions of the Representative Body are not always implemented by the Standing Committees of the Association." As the Chairman of the Winchester Division, Dr. R. Gibson, is a general practitioner and the first signatory of the memorandum this criticism has added force. The memorandum calls for reduction in membership of the R.B., a balanced representation of all sections of the profession, and a system which allows for adequate time for discussion of matters of first importance. The profession is now faced with medico-political problems of quite a different order from those which faced it 50 years ago, problems which affect all sections and not predominantly general practitioners. In dealing with these many and complex matters it needs now, more than ever, unity of purpose, integration of effort, the avoidance of sectionalism, and a concentration on objectives that would appear to many to be difficult to obtain in a body the present size of the R.B. The Winchester Division has done well to keep the debate open. Perhaps the outcome of this might be the formation of still another Constitution Committee.

ENDOCRINES IN TREATMENT OF CANCER

Recent experimental and clinical work suggests that endocrine therapy will eventually play an important part in the treatment of certain types of malignant growth. Thus neoplasms induced by hormonal stimulation may in the future be prevented or held in check by medical or surgical modification of the host's endocrine system.[1] Dr. Charles Huggins and his

colleagues in Chicago, working initially on experimental animals and later clinically, have confirmed the importance of endocrine therapy for certain types of cancer of the breast and prostate gland. Huggins's approach to this problem has been scientific rather than empirical, and has arisen from experiments on hormone-dependent tumours in animals. According to these experiments not all endocrine secretions, or substances with similar action to that of the recognized hormones, possess carcinogenic properties. The oestrogens and gonadotrophins are the only ones at present known to have them, and Huggins states that "when an oestrogen is a carcinogen its neoplasm-inducing properties are eliminated by testosterone; when a gonadotrophin is a carcinogen tumours are eliminated by gonadal steroids." Suppression or elimination of steroid hormones from the testes, ovary, or adrenal cortex causes regression of both mammary and prostatic growths, provided they are hormone-dependent neoplasms.

For more than a generation the ovaries have been regarded as an important factor in the causation of mammary cancer. Yet only rarely has complete regression of mammary growth been attained by ovariectomy in the human subject. An apparently successful case has recently been reported by Raven.[2] According to Huggins, the reason why ovariectomy influences occasional cases of human mammary cancer is that these particular neoplasms are independent of adrenal cortical function, whereas most mammary tumours are dependent for sustained growth upon adrenal steroids. This has been shown experimentally by Shimkin and Wyman,[3] who found that adrenalectomy reduced the incidence of mammary cancer in mice. Other experimental data[4] also support the contention that the adrenal cortex plays some part in the genesis of certain mammary tumours in animals. Such evidence, together with Huggins's own work, led him to believe that certain hormone-dependent growths of the mammary and prostate glands would regress when the adrenal factor had been eliminated by surgical removal.

Bilateral adrenalectomy in man was first successfully performed by Huggins and Scott in 1945. The initial results on patients suffering from cancer were not entirely successful, because at that time the post-operative hormonal maintenance of the patients was unsatisfactory owing to inadequate supplies of 11-oxygenated steroids. But some regression of prostatic growths was observed. Now that cortisone is available, bilateral adrenalectomy should no longer be regarded, according to Huggins, as a risky procedure. Total adrenalectomy for patients suffering from reactivated prostatic carcinoma, followed by the appropriate post-operative therapy, has also been recently advocated by Harrison, Thorn, and Jenkins,[5] who confirm the results previously obtained by Huggins.

In collaboration with Ling-Yuan Dao, Huggins[6] has recently reported that adrenalectomy also causes remission in both male and female human breast cancer. Bilateral adrenalectomy, performed at one operation on 42 patients suffering from either breast or prostatic cancer, has resulted in only two deaths, the last group of consecutive cases all surviving. One post-operative death occurred among eight patients with advanced mammary cancer. Four of the survivors showed very satisfactory remission of the disease, while in the remaining three the response was considered to be poor. The four patients in good condition seven to eleven months after adrenalectomy were considered by Huggins to have suffered from "adrenal-dependent mammary cancers." He lays great stress on the form of anaesthesia and on the post-operative hormonal maintenance with cortisone acetate, the details of which have been published separately in collaboration with Bergenstal.[7] Local or spinal analgesia is inadequate and details are given of the surgical technique for one-stage adrenalectomy under nitrous-oxide–oxygen–ether anaesthesia after sodium pentothal induction. The postero-lateral approach is preferred through an incision 20–25 cm. long made directly over the twelfth rib, which is resected. It is claimed that the operation can be completed in 60–90 minutes even with little experience.

Certain breast cancers in women may be ovary-dependent rather than adrenal-dependent. For these Huggins advises ovariectomy before, or simultaneously with, adrenalectomy. He recommends a two-stage operation in which the right adrenal and ovary are removed on one occasion, followed in about two weeks by removal of the left adrenal and ovary.

The difficulty still remains that it is impossible to determine before operation whether a mammary neoplasm is adrenal-dependent. Dependence seems to be a physiological phenomenon not necessarily accompanied by any distinctive morphological characters. The most favourable prognostic sign of the adrenal-dependent mammary tumour, in Huggins's

1 Huggins, C., *J. Urol.*, 1952, **68**, 875.
2 *British Medical Journal*, 1950, **1**, 1343.
3 *J. Nat. Cancer Inst.*, 1945, **6**, 187.
4 Wooley, G., *et al.*, *Proc. Nat. Acad. Sci. (Wash.)*, 1939, **25**, 277.
5 *New Engl. J. Med.*, 1953, **248**, 86.
6 *Ann. Surg.*, 1952, **136**, 595.
7 *J. Amer. med. Ass.*, 1951, **147**, 101.

view, is the presence of enlarged adrenal glands with hypertrophy of the zona glomerulosa. Experience has also shown that well-differentiated mammary tumours give the best response to adrenalectomy.

In a more recent and detailed review of this problem Huggins[1] admits that many questions relating to the treatment of appropriate neoplasms by adrenalectomy remain unsolved. He does not attempt to predict what percentage of patients with advanced mammary or prostatic cancer will respond or what the duration of remission will be. There seems to be little danger of adrenalectomized patients developing the Addisonian syndrome provided they are given the correct substitution therapy. In fact most of them seem to be maintained in excellent health, and many after a short time in hospital can resume their ordinary occupations.

GOLD UNDER SCRUTINY

It is only in recent years that the technique of the therapeutic trial has come to be studied with some degree of precision. New drugs are now born into a more rigorous climate than that which greeted their parents and grandparents, and their survival has been made far more difficult. They must undergo strict examination to decide whether they should reach maturity or oblivion. It may be salutary to speculate from time to time on the fate which would overtake some drugs now in regular use if they were to appear for the first time to-day unhallowed by tradition. But it is not necessary to assume that, because a treatment is empirical, therefore it would automatically be discarded under these circumstances. If a paper were to be published in this issue announcing the discovery of the potent effects of colchicine in acute gout, there is little doubt but that adequate evidence could be brought forward in support; yet no account of its mode of action could be given in our present state of knowledge.

In this issue we publish an investigation by Dr. Peebles Brown and Dr. J. P. Currie into the effects of gold therapy in rheumatoid arthritis. They failed to find any evidence that gold, when administered in the accepted manner, had any beneficial effect in 38 cases of rheumatoid arthritis. The cases were assessed after 3 months and at one year. Forestier[1] originally used gold salts in this disease because of claims that they were beneficial in tuberculosis and with the idea that rheumatoid arthritis might be a similar chronic infective condition. Despite the lack of evidence in favour of his original premises, gold has continued, almost alone, to hold its place in the treatment of this condition for nearly 25 years. Yet Short, Beckman, and Bauer[2] as recently as 1946 wrote, "The burden of proof is still on the proponents of gold therapy to demonstrate that a significant effect is exerted on the course of rheumatoid arthritis."

Peebles Brown and Currie do not claim that their failure to demonstrate any beneficial effect thereby establishes the fact that gold is of no value, and they draw attention to the fact that there is a good deal of contrary evidence already published—evidence which is not, however, entirely satisfactory. Moreover, most (though not all) clinicians of wide experience in the treatment of rheumatoid arthritis still believe that gold therapy is beneficial, and this cannot be ignored. What is certainly important is that this paper provides a sharp reminder that gold, in common with all other drugs, affords no short cut to the treatment of rheumatoid arthritis and that it is no substitute for the proper management of these patients. Treatment must include, in particular, the prevention of deformity and the maintenance of muscle power and joint range. Gold therapy must not divert our attention from these fundamental principles. Whatever the final outcome of this problem, the role of gold therapy in rheumatoid arthritis can be no more than a subsidiary one at present.

[1] *Bull. Soc. méd. Hôp. Paris*, 1929, **53**, 323.
[2] *New Engl. J. Med.*, 1946, **235**, 362.

LIFE AND HEALTH OF DOCTORS

What became of them all, our student contemporaries at school and hospital, after they qualified and went out into the world? Did the wild boys settle down, the clever ones become professors, the literary ones forsake medicine? Did all the predicted futures come true? For ancient friendship or for curiosity, for the chance to see which of our prognoses were right, the biographies of all those now lost to sight would be interesting: and, taken as a group for planned study, they have a sociological value and can guide administration, for they represent a kind of follow-up to show whether a medical school's initial selection of students had the right results and whether its training has fitted doctors for all branches of medicine. In a different direction they show the nurse's chances of marrying a doctor, and the doctor's chance of practising on his native heath—and whether these chances are changing. They can reflect the evolving customs and structure of our whole society and the professional man's shifting place in it.

Dr. A. Meiklejohn and his colleagues at Glasgow took the opportunity of the University's quincentenary celebrations there in 1951 to ask all their Glaswegian fellow students of 1923–6 twenty-five searching questions on their life and opinions. The results are published on p. 930, and represent replies from almost half of the 800 still alive, and information about the 99 who were dead. If it be assumed that the replies are representative for the whole 800, they throw light on two subjects—the doctor's health and the Scots doctors' contribution to medical practice. Three-fifths of the doctors were in general practice and another fifth had become consultants. In the years 1923–6 two out of every five new doctors put on the *Medical Register* were Scots.

[1] Hood, W. D., *Hlth Bull. (Edinb.)*, 1953, **11**, 19.

Scotland has long been known as a country producing doctors for export, and in 1926, with a population of about 4.8 million—representing only one-ninth of all the people in Britain—she was contributing nearly half the doctors. Nor has this position greatly changed. A recent analysis[1] shows that at present she produces about 550 new doctors annually, over half of whom must cross the border to find employment. In proportion to population this is a production three times that of England and Wales. Why this should be so requires further fact-finding, though the tradition maintained by the large and highly esteemed Scottish medical schools since the eighteenth century may provide a partial explanation.

Dr. Meiklejohn's paper has some interesting sidelights on the health of his group. Half the doctors who replied said they had never been seriously ill since they graduated. Among the 99 deaths were the expected excess due to coronary thrombosis, and also a surprisingly large number of drownings and poisonings, which seems to point to a suicide rate above that of the general population. Again it is surprising that one-quarter of all graduates were still unmarried ten years after qualification, though it must be remembered that, partly because of the 1931 economic slump, it was the custom to marry later than it is to-day. After twenty-five years 90% of the graduates had married. It would be interesting if other medical schools made similar investigations among their old students, for in this way there could gradually be built up a real picture, both sociological and psychological, of the doctor as a man and as a member of the community.

INTRINSIC FACTOR IN THE TREATMENT OF PERNICIOUS ANAEMIA

Despite the fact that the blood counts of patients suffering from pernicious anaemia can be restored to normal by the parenteral administration of vitamin B_{12}, the precise pathogenesis of the disease is still not entirely clear. It is generally believed that the fundamental defect is simply a failure of the upper alimentary tract to absorb vitamin B_{12} (extrinsic factor), and that this is due to lack of a substance (intrinsic factor) which is normally present in gastric juice.[1] Some progress in the identification of intrinsic factor has been made in recent years. Evidence put forward by Glass[2,3] in the U.S.A. and by Latner and Ungley[4] in this country shows that a gastric mucoprotein or mucopolysaccharide has great intrinsic-factor activity, but whether the mucoprotein is intrinsic factor itself or is merely a carrier of it has not yet been established.[5] Gastric juice from normal subjects or gastric extracts containing intrinsic factor unquestionably facilitate in some way the absorption of small amounts of B_{12} when given by mouth.

Exactly how intrinsic factor brings about this absorption remains to be discovered. It is a conceivable but unproved hypothesis that combination with intrinsic factor may assist the passage of B_{12} through the cell membranes of the intestinal epithelium.[6] A quite different explanation was indicated by the work of Ternberg and Eakin,[7] who showed that certain bacteria which required B_{12} for growth failed to grow if gastric preparations were added to the medium—a possible reason for this being that the B_{12} was "bound" and in some way made unavailable to the bacteria. It was therefore suggested that in a healthy man the binding of vitamin B_{12} by some component of gastric juice might prevent the utilization or destruction of B_{12} by bacteria within the upper intestine. But it was later shown that bacteria which could not grow in the absence of the vitamin constituted only a very small part of the intestinal flora, and also that proteins other than intrinsic-factor-containing material had the property of making B_{12} unavailable.

On the other hand, it is now known that certain bacteria, including some strains of *Bact. coli*, take up large amounts of B_{12}, although not actually requiring it for growth.[8] The presence of bacteria in the upper intestine in patients with pernicious anaemia may therefore still be of importance. Moreover, it has been claimed[9,10] that the very large uptake of B_{12} by *Bact. coli* could be prevented by giving small amounts of gastric preparations, and that this did not happen with other protein and organ extracts.[11] Hoff-Jørgensen, Skouby, and Andresen[12] concluded that the "coli factor" and intrinsic factor were probably identical. Following up this idea, they have carried out some preliminary clinical trials with gastric extracts previously assayed for their ability to inhibit the adsorption of B_{12} by *Bact. coli*.

This work is clearly of importance, since a convenient method of assaying intrinsic factor is badly needed, not only as an aid to the purification of intrinsic factor itself but also as an essential step in the preparation of gastric preparations intended to be used therapeutically in pernicious anaemia. Whether or not oral treatment with gastric extracts combined with vitamin B_{12} can compete in effectiveness with parenteral treatment with the vitamin alone would seem to depend upon the reliability of the preparations intended for oral administration, the regularity with which patients absorb and respond to oral preparations, and their cheapness. It is hoped that oral preparations will not be used in the routine treatment of pernicious anaemia until they have been thoroughly tested under carefully controlled conditions. In any case it would be regrettable if their use led to a lessening of the personal supervision of the patient that the use of parenteral preparations at present entails.

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7 *J. Amer. chem. Soc.*, 1949, **71**, 3858.
8 Davis, B. D., and Mingioli, E. S., *J. Bact.*, 1950, **60**, 17.
9 Burkholder, P. R., *Arch. Biochem.*, 1952, **39**, 322.
10 Hoff-Jørgensen, E., ibid., 1952, **36**, 235.
11 —— and Lanboe-Christensen, E., quoted in footnote 12 below.
12 *Nord. Med.*, 1952, **48**, 1754, 1760.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

INJURIES TO THE BACK—II

BY

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Simple compression fractures are produced by hyperflexion of the spine, which may be caused by direct violence such as a weight falling on the back or by indirect violence such as falling on the feet from a height. The former is by far the more common, and two-thirds of the resulting fractures are in the dorso-lumbar region. They are often called "wedge fractures," because they produce a characteristic wedge-shaped deformity of the vertebral body. The deformity is never great, however, and in many cases cannot be recognized clinically. If the vertebral body is crushed by more than one-third of its height anteriorly, the ligaments posterior to the fulcrum (see Part I of this article, printed in our last issue) are almost certainly ruptured. Subluxation then occurs with separation of the spinous processes and the condition is no longer a simple compression fracture but a fracture-dislocation. The differentiation is very important, because, whereas a simple compression fracture is stable and relatively innocuous, a fracture-dislocation is extremely dangerous and associated with a high incidence of damage to the spinal cord or nerve roots.

Management of Simple Compression Fractures

It used to be taught that all compression fractures, however slight the deformity, should be corrected by hyperextending the spine and immobilizing it in plaster-of-Paris for three to four months. There are still many adherents of this view, but it is becoming increasingly accepted that most of these fractures can be treated as soft-tissue injuries with much less trouble to the patient, a quicker return to work, and a better functional result. This view is based on the fact that if the fracture is stable—that is, if the fulcrum and the ligaments posterior to it have remained intact—the deformity is necessarily slight and will not increase even if the spine is not immobilized. The fracture is a crushing of the cancellous bone and will therefore heal readily and rapidly even without fixation.

It has also been established that in a series of functionally perfect results there is the same proportion of patients with residual deformity as in a series of poor results. Deformity in itself is therefore not the crucial factor, nor can it be prevented in certain cases, even if the fracture is reduced and immobilized for a prolonged period. In many of these cases the intervertebral disk has been irretrievably damaged, and, since it is a structure devoid of blood supply, it is incapable of repair and will inevitably collapse once the supporting plaster is removed. It is such considerations as these that have led to a modification of our views about the treatment of simple compression fractures, though it cannot be stressed too strongly that the decision rests on an appreciation of the stability of the fracture and its differentiation from fracture-dislocation or fracture-subluxation. This calls for considerable experience in the interpretation of *x*-ray films and the films must be of very high quality.

Fig. 1 illustrates a stable compression fracture which was treated on these lines. The patient was kept at rest in bed for three weeks. He was then transferred to a rehabilitation centre, where he proceeded through the normal course of progressive remedial exercises for spine cases. Treatment was completed in eight weeks and he returned to light work. In three months he was back at his ordinary work as a miner and *x*-ray films at that time showed that the fracture had consolidated without any increase in the amount of wedging. In other words, he was back at full work at a time when under the older method of treatment he would still have been in plaster.

However, the above regime may seem to be such a departure from orthodoxy that it is permissible to digress for a moment and consider the basic principles underlying the use of plaster or other immobilizing agents in the treatment of fractures, lest it become a ritual rather than a scientific procedure. There are only two reasons for immobilizing a fracture: one is to place it at complete rest in order to promote union, the other is to maintain reduction until union has occurred. There are many fractures, however, that will unite whether immobilized or not (fractures of the ribs, for example, which cannot be immobilized). There are other fractures—for example, of the clavicle—in which deformity within certain limits does not affect function. Simple compression fractures of the spine fall into both categories, so there is no scientific basis for reduction and prolonged immobilization. If plaster is used in such fractures it should be recognized for what it is—namely, a method of resting damaged soft tissues during the initial stages of healing—and as such it may be entirely justified. While I subscribe to these views, however, it must be stressed that there are still many authorities who adhere to the methods advocated by Böhler and Watson-Jones that all compression fractures of the spine should be immobilized in hyperextension for three to four months.

FIG. 1.—Radiograph of simple compression fracture.

Fractures of the Laminae

These injuries are comparatively rare, but their importance lies in the fact that they are difficult to detect, yet because of their instability they may result in the condition known as spondylolisthesis. The lesion occurs in the lowest part of the lumbar spine and is caused by a combination of flexion and rotation. It is often associated with fractures of the transverse processes. The laminae fracture near their junction with the pedicles and this allows the upper vertebra to slide forwards on the lower one, particularly at the lumbo-sacral junction, where the force of gravity alone will produce progressive displacement if the fracture is undetected and the patient is allowed to walk about. High-

quality *x*-ray pictures, including lateral and oblique views, are needed to reveal these fractures. If they are detected before forward displacement has occurred they should be immobilized in a full plaster-jacket, including both thighs so as to fix the lumbo-sacral junction. Once displacement has occurred, reduction by manipulative methods is impossible and fusion of the affected spinal segment should be carried out to prevent further displacement.

Spondylolisthesis also occurs as the result of a congenital defect in the laminae. It is a gradual process which often does not produce symptoms until adult life. These symptoms may be precipitated by an injury to the lower part of the spine, so that the congenital variety may be revealed for the first time following trauma. There is no doubt, however, that traumatic spondylolisthesis resulting from actual fracture of the laminae is a real entity. The spinal cord is not endangered to the same extent as in fracture-dislocations, because the neural arch posterior to the fracture or congenital defect is not displaced forwards. The nerve roots can, however, be involved in this displacement, causing a radiating type of pain. The roots affected are usually the fifth lumbar or first sacral, so that spondylolisthesis is one of the conditions apt to be confused with a prolapsed intervertebral disk.

Fracture-dislocations

Fracture-dislocations are the result of direct violence causing hyperflexion, and they are the most dangerous of all spinal injuries because of their tendency to cause damage to the spinal cord or cauda equina. The supraspinous, interspinous, and capsular ligaments, which stabilize the spine in flexion, are all ruptured, allowing the spinous processes to separate and the posterior intervertebral joints to dislocate. The flexion force causes a forward displacement of the upper vertebra and a compression fracture of the lower one (Fig. 2). At least 50% of these fracture-dislocations are associated with damage to the spinal cord or cauda equina, causing varying degrees of paraplegia or quadriplegia according to the level of the injury. They are among the most difficult of all first-aid problems, particularly as most of them occur in mining accidents and the patient may have to be extricated from a very confined space. Any movement of the patient which increases the flexion deformity may damage the cord irretrievably, therefore the handling and transport of these men is of the utmost importance. The angular deformity can always be felt, as can the large gap between the spinous processes.

FIG. 2.—Radiograph of fracture dislocation.

Some years ago it was advocated that all back injuries should be transported in the prone position to avoid any possible flexion of the spine, and this is no doubt the safest procedure if it is practicable. There are often circumstances, however, which make it impracticable, and then the main concern of the first-aid worker should be to ensure that at all times the spine is supported and not allowed to flex. The same precautions must be observed during the reception of the case into hospital and during the *x*-ray examination.

Some fracture-dislocations can be reduced by manipulative means, but in others the dislocated facets become locked and reduction cannot be achieved except by operation. Locked facets can usually be demonstrated on *x*-ray examination, although once again it must be stressed that high quality *x*-ray films are needed to disclose these details.

All fracture-dislocations are highly unstable and a great danger to the spinal cord. They should always be reduced at the earliest possible moment either by manipulative or by operative methods, depending on whether the facets are locked or not. If manipulative reduction is possible and there is no paraplegia, fixation in plaster should be carried out for four months with frequent *x*-ray checks to ensure that reduction is maintained. If operative reduction has to be carried out, it is usual to supplement it by applying a bone graft to the spinous processes as an additional safeguard against late redisplacement. In either case a period of four months' fixation in plaster is necessary, but during most of this time the patient may be ambulant. On removing the plaster, progressive remedial exercises are carried out, together with other forms of rehabilitation such as recreational and occupational therapy. It may be eight months before the patient is fit to resume work, but if sound union is obtained and the injured segments of the spine are securely stabilized there is no reason why these cases should not eventually achieve the same degree of fitness as those with simple compression fractures.

Traumatic Paraplegia

The system of treatment outlined above for fracture-dislocations of the spine does not apply to cases complicated by paraplegia. In these the use of plaster inevitably leads to pressure sores and thence to a vicious circle of complications ending in renal failure. The treatment of traumatic paraplegia would demand an article in itself, so the present review must necessarily be confined to a brief survey in very general terms.

Paraplegia following spinal injuries was first described about 5,000 years ago in the Edwin Smith Papyrus, and the author of that remarkable document summed up treatment in the words "an ailment not to be treated." His view, no doubt, was that the physician should not try to prolong a state of misery which he was powerless to alleviate, and any doctor who has worked long enough in a mining community to become familiar with the distressing spectacle presented by these unfortunate patients might well be forgiven for agreeing with him. Unable to move, incontinent of urine and faeces, with large stinking pressure sores getting larger as the patient becomes more emaciated, painful involuntary spasms, contractures, urinary sepsis, renal calculi, and finally uraemia—this is the distressing sequence of events that is often dragged out for four or even five years.

The change that has been brought about in the past 10 years is almost unbelievable, and the story of its accomplishment is one of the most remarkable "combined operations" of surgery and social medicine. It demands a degree of special knowledge, skill, nursing attention, and social welfare that can be achieved only in special units, but that it *can* be done has been proved beyond all doubt by the work of such centres as Stoke Mandeville and Wharncliffe in this country and by many others in America. There can surely be no middle course with a condition capable of causing such prolonged misery and suffering: it must be treated either superbly well or not at all. The worst thing that can happen to these unfortunate patients—and there is no doubt it is still happening—is that they should be treated well enough to prevent them from dying but not well enough to make life worth living.

Next Refresher Course Article.—"Anticoagulant Therapy," by Dr. H. Payling Wright.

TWENTY-FIVE YEARS IN MEDICINE

A RETROSPECT

BY

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"Dear Fellow-Student,—Nearly 25 years or more have passed since we graduated in the years 1923, 1924, 1925, and 1926. In the intervening period we have become dispersed all over the globe and into every branch of the profession. Some, no doubt, have been more fortunate than others; not a few have died long ere their prime. The experience of the goodly company must form a most interesting and not insignificant chapter in medical annals."

These were the opening lines of a letter which a group of doctors* addressed in 1950 to their companions of undergraduate days.

Origin of the Inquiry

In June, 1951, the University of Glasgow was due to celebrate the quincentenary of its foundation. Many graduates, it was anticipated, would make the pilgrimage to join in the ceremonies and to pay tribute to their Alma Mater. A small group of medical graduates foresaw in this occasion a unique opportunity for a reunion with their fellow students, in which it might be possible to discover something of the collective story of the years between.

The men involved were the graduates in medicine in the four years 1923–6, which means that by 1951 each had achieved at least 25 years of practice. In the course of their lifetime they had endured two world wars and the economic slump of the early 'thirties; they had lived in a golden age of advance in medicine and had been involved in the inception of the National Health Service on July 5, 1948. As undergraduates they had studied under such renowned teachers as Macewen, Muir, Cathcart, and Carl Browning, and from these teachers they had shared in the continuing glory and inspiration of Lister, Hector Cameron, and Gairdner. As medical men, over a quarter of a century as rich and varied as any in the medical and social history of Great Britain, they had experience of three generations of practice and teaching, as exemplified by their teachers, their contemporaries, and their assistants, who in some instances were their own sons and daughters.

Method of Inquiry

The only means of contacting each individual was by a questionary distributed by post. All the names were available in the graduation lists. Information enabling us to trace those still alive was available in the current *Medical Register*. In the case of those deceased the Registrar of the University was able to provide certain particulars.

The committee was fully aware of the defects of this type of survey, and that the response might not exceed 30%. The purpose of the inquiry was explained in a covering letter, of which the opening lines have been quoted, and it is worthy of record that not only did 48% complete the form but many expressed their gratitude for this link with the past. There were 25 questions, occupying four foolscap pages, and these required much time and thought. The questions were divisible into two main groups: (*a*) facts and (*b*) opinions. The nature of these appears from what follows.

Population at Issue

The graduates numbered 899, and at June 30, 1951—a minimum interval of 25 years since graduation—800 were alive and 99 dead (Table I). Of the 800 survivors, 385 (48.1%) completed and returned the questionary.

The Registrar of the Medical Council has provided the details, shown in Table II, of new medical registrations for the same years. Scotland therefore provided 40.8% of the total new medical registrations in Great Britain, while the present group represented no less than 11.9%.

In the relative number of replies and in the analysis of the data which follows there emerged a remarkable identity in the individual years. While this is not proof that the respondents constitute a fair sample of the total population, it is at least suggestive that the findings may be representative of the whole group.

TABLE I.—*Follow-up of Graduates, 1923–6, as at June 30, 1951 (899 Graduates)*

Year of Graduation	No. of Graduates	Replies		Deceased	
		No.	%	No.	%
1923	263	109	41·4	31	11·8
1924	290	130	44·8	29	10·0
1925	195	80	41·0	22	11·3
1926	151	66	43·7	17	11·3
1923–6	899	385	42·8	99	11·0

TABLE II.—*Medical Registrations (Male and Female) 1923–6*

Year	Great Britain	Scotland
1923	1,853	878
1924	2,125	935
1925	1,982	736
1926	1,586	527
1923–6	7,546	3,076

Present Practice

Dr. Johnson's dictum that the fairest prospect for a Scot is the broad highway to England (single ticket) is not altogether supported by the present location of these 800 doctors: 52% are in England and Wales, 40% in Scotland, mainly in the south-west, and 8% abroad. Rather more than half held house appointments, and they are now distributed as follows: general practice, 59%; consultant practice, 18%; appointments, 21%; others, 2%. Many of the consultants of this period graduated through general practice, and almost unanimously they commend the benefit of this experience. Indeed, it is generally urged that all doctors should spend some time in general practice. The period need not be long; many thought it should be one year.

Marriage (385 Replies)

Only three were already married before graduation, but by the date of the inquiry 91% had married. The marriage state in relation to graduation year of the 385 graduates was as follows:

Married at end of 5 years	42.7%
" " " " 10 "	75.5%
" " " " 15 "	86.7%
" " " " 20 "	89.3%
" " " " 25 "	90.9%
Unmarried	9.1%

General practitioners married early; consultants and others were more tardy: immunity seems to increase with the years, but it is doubtful if it ever becomes complete. Remarriages were rare.

The occupation of the spouse is of some interest; thus 7% of the 385 graduates married doctors, 19% nurses, and the remainder "other occupations." If this pattern of marriage selection is general to the profession, then, having regard to the relative proportion of male to female graduates, an interesting deduction follows—namely, that between 30 and 40% of women graduates marry doctors.

The 350 marriages resulted in 295 (84%) families, numbering 703 children, of whom all but 32 (4.6%) survive. The number of children in family ranged from 1 to 10, with an average of 2.4. According to "Census 1951, Great Britain, One Per Cent. Sample Tables" (H.M.S.O., 1952) at April, 1951, the average size of families in Scotland was 2.03, compared with 1.69 in England and Wales and 1.72 over the whole of Great Britain. The most appropri-

*J. Black, A. M. Campbell, A. S. Henderson, J. A. Imrie, A. G. Mearns, and A. Meiklejohn.

ate comparative figure, however, may be that for Scots-women aged 45–49 years and married for 15–19 years, whose average size of family (including children who have since died) is 1.87. In the professional classes the figure was 1.41 (18% below the figure for all classes combined).

Analysis according to the occupation of the spouse revealed no difference between the groups—doctor, nurse, and "other occupations."

Social Pattern of Marriage and Family

The preceding facts raise certain serious considerations for the profession under present-day circumstances. It seems reasonable to assert that this social pattern of marriage and the family is unlikely to change radically in the near future, if indeed ever.

Medical studies now begin at the age of 18 years and extend over a minimum period of six years. Thereafter one year must be spent in hospital appointments and a further two years in National Service. This means that the young doctor will have attained the minimum age of 27 years before he is free to begin his career. During the next 10 years the prospect is marriage and a family of two or three children. Other considerations apart, this represents a heavy financial load for a further 20 years—indeed, until the parents are approaching ages between 50 and 55 years. This involves serious implications concerning the remuneration and social status of all future doctors and their families. Distant prospects and rewards of hard practice thus assume relatively less importance than the assurance of an adequate income in the early and middle years. The satisfaction of vocation, no matter how complete, will not suffice; indeed, it is not likely to be attained unless supported by a reasonable freedom from economic pressure. These are not insignificant matters, because from them must derive the whole quality of the National Health Service.

In recent controversies it has often been asserted that in future medical men will not enter their children for medicine. This would seem to ignore the well-founded observation of a family trend in certain occupations, and it is not altogether supported by recent applications to the medical schools. From the present group 136 (20%) among 671 children have already graduated or are studying for a medical degree. Moreover, these 136 children derived from 295 families, signifying that approximately one family in every two maintains continuity in the profession. Many of the girls have entered nursing and associated professions in hospitals. Furthermore, many are still at school and too young to have chosen their future career.

As a supplement to the foregoing, inquiry has been made into the broad occupational groups which provide new entrants to the study of medicine (Table III). This is of interest in so far that educational grants for study at a university are now more generally available than heretofore. There are many factors which could influence this pattern, and it is not possible from the figures to make any precise deduction. This notwithstanding, it does not seem that as yet in the West of Scotland there is any alteration in the number of students from the artisan and labouring groups. Scholarships and grants, however, may be of real assistance to all classes where the father is deceased.

TABLE III.—*Pattern of Applicants (Male Students) to Faculty of Medicine According to Occupation of Father (University of Glasgow)*

Category	1918–22		1950–3	
	No.	%	No.	%
Medical practitioners ..	65	7·2	136	14·2
Other professions	221	24·7	213	22·2
Business	378	42·2	303	31·6
Artisans and others ..	203	22·7	201	21·0
Not stated or Deceased {	29	3·2	29	3·0
	—	—	76	8·0
Total ..	896	100·0	958	100·0

Health and Sickness

A specific question was asked about major illnesses since graduation, with special reference to dates, duration, and residual disability. No less than one-half of the total, all now aged about 50 years, stated with gratitude that they had not suffered any serious sickness.

An analysis of the illnesses recorded revealed the predominance of gastro-intestinal affections, appendicitis, cholecystitis, peptic ulcer, and dysentery. In relation to these the interesting fact emerged that almost invariably these conditions were treated surgically, and that cholecystectomy was usually supplemented by appendicectomy. Respiratory diseases, pneumonia, and tuberculosis were next in order of frequency. Altogether nine cases of coronary thrombosis were recorded. The acute infectious diseases usually associated with childhood were not infrequent, and there were several cases of acute poliomyelitis.

A matter of vital concern to the profession arises from these answers—one which, so far, has received all too little emphasis. It concerns those doctors who, through chronic disabling sickness or accident, become handicapped for their work, particularly general practice in industrial areas. Hitherto such persons could seek alternative work in appointments in the public health service, in laboratory work, in some specialty, or in transfer to a less arduous general practice. Nowadays, under the National Health Service, there is neither freedom of entry nor of transfer in the various branches of the profession. Medical boards would appear to be their only refuge, and a place on these is not easy of attainment. Meanwhile the profession is continually being enjoined to increase its concern with the rehabilitation and resettlement of disabled and aged workmen. This is right, but at the same time there is urgent need to ensure adequate arrangements for disabled and aged members of our own profession.

It may also not be without relevance to remark that this observation has an important bearing on the health of students. Each year a number of students with a history of tuberculous disease, at the time regarded as closed or quiescent, and other disabling conditions are admitted—and rightly so—to medical schools. For these there is a need for regular medical supervision and vocational guidance. Such interest should not be opposed or be regarded as an infringement of individual freedom.

Deaths

Of the original 899 graduates, 99 died during the intervening period, and the detailed certified cause of death was obtained in 90 cases; this information was not available in the others, who died abroad.

The incidence of deaths in individual years varied between one and eight, and no fewer than four deaths occurred within one year of graduation. The principal causes of death are shown in Table IV.

TABLE IV.—*Causes of Death*

Cause	No.	Remarks
Unnatural (violence, 12; drowning, 5; poisoning, 8)	25	5, war
Pulmonary tuberculosis	10	
Pneumonia	10	
Bronchiectasis	2	
Cancer	9	5, lung
Coronary thrombosis	9	
Other heart disease	3	
Nephritis	4	
Furuncle of nose	4	
Miscellaneous	14	Of each 1 case
All causes	90	

Mortality in Glasgow Medical Graduates

By courtesy of Dr. W. P. D. Logan, of the General Register Office, Mr. B. Benjamin examined these causes of death. Assuming—quite reasonably—that the graduates were all aged 20–24 and uniformly distributed over that

age group, he found it was possible to apply life-table factors to calculate the expected deaths in successive periods of time. Thereby he was enabled to compare the expected number of deaths with those actually experienced and to determine whether or not the mortality among the graduates was greater or less than that of the body of lives from which the table was derived. For this comparison the Scottish Life Table, 1931, was most appropriate.

It emerged that the mortality experienced by the graduates was a good deal lighter than the mortality of the Scottish population as a whole (urban and rural mixed).

When the distribution of causes of death was compared with that expected it was found that deaths from tuberculosis were much fewer than would be expected on a general-population basis. Deaths from heart disease in total were not significantly greater than expected, but the number certified as from coronary thrombosis was excessive.

The four deaths from "furuncle of the nose," which at first sight seemed unusual, were found to conform to previous experience of mortality of doctors from septicaemia, carbuncles, and boils.

The only significant excess of deaths was from violence. Excluding the five war injuries, 20 graduate deaths resulted from violence. On the basis of statistics for England and Wales the expected number from drowning should have been one, and from poisoning two—the actual figures were five and eight respectively, greatly in excess of expectation. Mr. Benjamin summed up: "The general impression (and the data do not justify more than an impression) is that the mortality of these Glasgow graduates differed from that of the general population in so far as there was (*a*) an excessive incidence of violent deaths (drowning and poisoning), and (*b*) an excess mortality at ages 30–34 followed by lighter than average mortality. Whether (*a*) and (*b*) are the same depends on the provision of data of age *and* cause together. It looks as though, but for excessive violent deaths, the graduates' mortality might have been below average." (Note the ages at death by drowning were 24, 25, 32, 42, and 45; and by poisoning 36, 37, 39, 39, 42, 45, 48, and 61.)

Activities and Outlook

The remaining questions were directed to discovering something of the general activities and outlook, and the impressions formed in 25 years of practice. Higher qualifications obtained by examination were very common, but the M.D. degree, which at Glasgow University requires the presentation of a written thesis based on original work, had been conferred on only 14% of the group (800). A few had engaged in local government, but activities outside professional work were almost entirely confined to meetings of medical organizations and societies.

Almost all had found medicine a satisfying way of life, but there was much condemnation of conditions of practice following the introduction of the Health Service. In this matter, however, it was rather disappointing to note that the criticisms were expressed in the trite phrases of the medical press—frustration, loss of status, excessive demands of the public, too much work and too little time, bookkeeping and form-filling, and the wife the unpaid drudge of the Health Service.

Medical Education

There was a very consistent demand for a general course comparable to the old *studium generale*, as an introduction and background to the subjects of professional study. While it was recognized that new discoveries and developments in all branches of medicine had greatly increased the amount of knowledge to be acquired, the need for the extension of the period of undergraduate study to six years was not generally acknowledged. On the contrary, many submitted that a five-year period was adequate if teachers made more effectual use of the time. Thus there was ample scope for the diminution in the number and length of systematic lectures, particularly of those which were largely a recapitulation of textbook material. Similar criticisms were directed against ward rounds and demonstrations of patients suffering from advanced and rare diseases. More of the available time, it was urged, should be devoted to clinics, with the focus on everyday ailments and the beginnings of disease.

As to individual class subjects, a demand appeared for the co-ordination of the primary scientific studies in a course on biology. While many condemned the emphasis on the minute details of anatomical dissection, they recommended a more continuous and thorough teaching of anatomy and physiology as part of clinical instruction. Materia medica and therapeutics attracted adverse comment, in which there was a demand for more intensive instruction in the proper use of medicaments, particularly those which had established their worth.

As to what they recognized as recent advances in medicine, individual opinions were obviously influenced by the sphere of practice. It was, however, abundantly clear that the general practitioners attached chief importance to those measures which assisted in the management of chronic disease—for example, insulin and liver therapy. Diphtheria immunization was generally acclaimed.

Finally, what present as the challenges of our age? The answer is, the care of the aged and infirm and the chronic sick, the control and management of tuberculosis, and the need to link general and hospital practice more effectively towards the fulfilment of the Health Service.

This story, and it pretends to be nothing more, was made possible only by the co-operation and encouragement of our fellow-students, and to them the members of the team wish to convey their sincere gratitude and greetings for the future. They also wish to record their thanks to Dr. W. P. D. Logan and Mr. B. Benjamin, of the General Register Office; to Mr. C. Weston, Registrar of the General Medical Council; to Mr. T. H. Graham, of the Branch Medical Council Office for Scotland; to Dr. R. T. Hutcheson, Registrar of Glasgow University; to Dr. R. A. Robb; and to Miss Meikle, who undertook the secretarial work. We are also indebted to the University Court, who defrayed the cost of the inquiry.

THE PROBLEMS OF CONVALESCENCE

A two-day conference in London, attended chiefly by almoners, matrons, and superintendents of convalescent homes, was held, under the auspices of King Edward's Hospital Fund, on April 10 and 11. The questions of quicker turnover of hospital beds, the needs of the early convalescent, and the psychology of recovery were discussed. Professor Alan Moncrieff said that one unfortunate circumstance, elicited by a King's Fund survey not long ago, was that over a quarter of the patients recommended for convalescent homes had to wait in hospital an average of eight days before transfer—a sheer waste of hospital bed-time. One reason for delay was that the placing of convalescent homes had no strict relation to the regional organization of the National Health Service or even to the situation of the hospital. Convalescent homes had also various restrictions and regulations which tended to prevent early transfer. It would not be a great exaggeration to say that some of them took patients only when the patients had so far recovered that they could go home. Some of them, for example, would not take a child who had had chorea until all choreic movements had ceased; they feared that other children might catch the movements by imitation. Professor Moncrieff thought that convalescent homes should be prepared to undertake simple nursing duties, such as the giving of enemas, syringing of cavities, application of strappings and dressings and the like, and they should make provision for physiotherapy and occupational therapy.

The point of view of the convalescent home was put forward by Dr. J. O. Reid, of Princess Mary's Hospital (Rehabilitation), Margate. He envisaged a convalescent hospital in every region which should take and treat all kinds of patients. Every convalescent home, he said, should have a doctor of wide clinical experience and a "restoration minded" nursing staff. Treatment, especially simple physiotherapy, must come first, but as much freedom should be allowed as possible, for freedom restored the sense of self-reliance and responsibility. The patient must,

however, be controlled and guided throughout the whole period. Given proper facilities at the convalescent home, patients should be sent there earlier; application for admission should be made earlier by the general hospital, not on the day of the patient's discharge.

He had letters from almoners saying that the transfer must be postponed because the wound had not healed, but in convalescent homes they should welcome wounds that were not healed. In his own hospital they carried out 5,000–6,000 major dressings a year. Not all patients would fully recover, and these must be taught in the convalescent home to live with their disabilities. Dr. Reid also referred to the amount of drugs which patients brought with them from hospital—"whole winchesters of medicines." It seemed to be thought that convalescent homes had no doctor who could prescribe for patients.

Finally, Dr. J. S. Richardson, of St. Thomas's, considered the psychology of convalescence under the three heads of childishness, anxiety, and depression. He felt that a point to be remembered in dealing with convalescents was that the majority of them were gregarious and resented too much solitude. But there was also the quiet person, to whom mixing with a crowd was an ordeal. He quoted a psychiatrist colleague as saying that people with depression of the endogenous type should not be sent to convalescent homes at all, and that not a few cases of suicide had resulted from sending them. The physical expressions of depression were severe headaches, possibly constipation, slow movement, and aches and pains of the "dragging" type. Dr. Richardson was insistent that patients should not be kept too long in a convalescent home. There was an optimum period when they should be discharged, and in this last statement he was supported by Sir Henry Tidy, from his experience of Red Cross convalescent hospitals during the war, who said that, while it could not be laid down as an invariable rule that patients should be discharged at the end of two or three weeks, it was important to keep in mind some general limit of that kind.

Nova et Vetera

JOHN ABERNETHY

John Abernethy: A Biography. By John L. Thornton, A.L.A. Librarian of St. Bartholomew's Hospital Medical School. (Pp. 184. £1 5s.) London: Simpkin Marshall. 1953.

Of such as Abernethy it has been said that "they enjoyed their immortality in their lifetimes" and, by implication, not after. Abernethy takes no important place in the history of surgery, but he was an extremely popular teacher, a remarkably successful practitioner, and, above all, the effective founder of St. Bartholomew's Hospital Medical College. Locally, at the school that he founded, his reputation remains immense. The matter is well summed up by Sir Arthur Keith, whom Mr. Thornton quotes: "There is one side of a man's nature which can never grow old—never pass out of date or fashion. That is his character. Abernethy as a man will never be out of date."

John Abernethy (1764–1831) was born in London, well educated, and early attracted to surgery. He was apprenticed to a surgeon, as the manner then was. His master was a surgeon at St. Bartholomew's, and there he learned much of his art from the lectures on the subject by that admirable exponent, Percivall Pott (1714–89). Meanwhile he attended anatomical lectures at the London Hospital. In 1787 he was elected assistant surgeon to Bartholomew's, but had to wait 28 years before reaching the full staff. As assistant surgeon he began to teach anatomy at his private house until in 1791 he succeeded in persuading the governors to build a lecture theatre. There he lectured for many years to very large audiences on anatomy, physiology, and surgery. He was a devoted admirer of John Hunter (1728–93) and a supporter of William Clift, Hunter's secretary, in his gallant, devoted, and successful stand to keep his great master's collection intact. Thus Abernethy should be remembered for his share in developing the scientific idea of a museum.

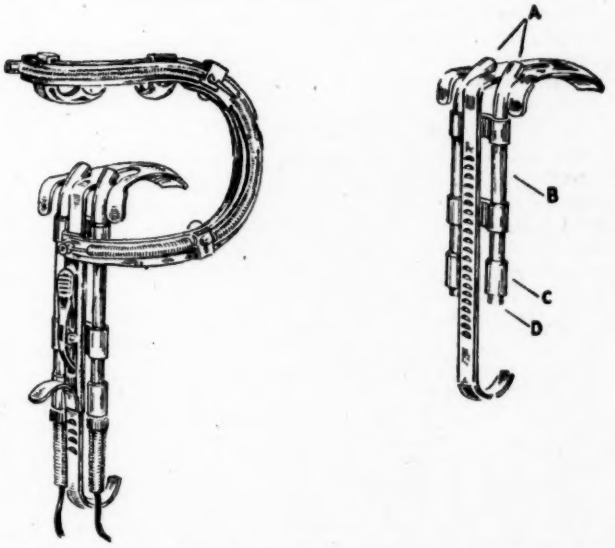
But when it is asked what were Abernethy's positive achievements, no adequate answer can be given. His contributions to anatomy and physiology are insignificant. True he was the first to ligate the external iliac artery successfully for aneurysm, but he disliked operating, and his best professional claim is that in those days of heroic surgery he adopted and constantly inculcated reasonably conservative and expectant tactics, combined with cleanliness which, however, could not in those days be aseptic. But he was a judge of men, and his greatest discovery was Richard Owen (1804–92), the most eminent comparative anatomist that Britain has produced. He promoted the student Owen to be his prosector and later recommended him for the museum of the College of Surgeons. Thus the spirit of Abernethy stands as that of a sort of elder statesman at the back of much of modern medical and scientific education. His life was well worthy of the pleasant and beautifully illustrated account which Mr. Thornton here provides, for it was a good life, well and fully lived.

CHARLES SINGER.

Preparations and Appliances

LIGHT ATTACHMENT FOR DOTT'S GAG

Mr. W. G. HOLDSWORTH, F.R.C.S., of the Plastic and Jaw Unit, Rooksdown House, Basingstoke, writes: Two methods of illumination are available for palate surgery. One is a headlight and the other a scialytic lamp near the surgeon's head. Neither of these is altogether satisfactory, and with the idea of having the light actually within the mouth the device illustrated was made. This is a tongue-piece



carrying two lamps, the rays of which are directed on to the palate (A) through columns of "perspex" (B) bent as required and sheathed in metal. The danger of sparking is virtually eliminated by having the lights at a distance from the mouth (D) and enclosed by screw attachments (C) to the metal sheaths. Even with prolonged use there is no rise in temperature of any part. Illumination is by a 4½-volt battery. The whole appliance, including the flexible leads, can be boiled. The lighting system was devised by Messrs. Vann Brothers, Ltd., after prolonged and persistent experiments, and the tongue-piece was constructed by Chas. F. Thackray, Ltd. As shown, the appliance fits on to the Dott's gag, which is used by most British surgeons when operating on the palate.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Neonatal Intestinal Obstruction

SIR,—Dr. W. P. Sweetnam and his colleagues (*Journal*, April 4, p. 765) are to be congratulated on their successful case of intestinal atresia in the newborn. In their discussion they refer to an article published by one of us (Rickham)[1] in which the development of regional neonatal surgical centres was strongly advocated. They mention that the delay and disturbance involved in transferring these babies to a centre would be harmful, and they also argue that operations for intestinal obstruction in the newborn should remain within the province of the general surgeon. These statements prompt us to reply.

Neonatal surgery has made great strides during the last dozen years; so rapid has been the advance that many recent developments and figures have, as yet, not been reported in the literature. The figures published by Ladd and Gross[2] (quoted by Dr. Sweetnam) were collected in the 'twenties and 'thirties and are completely out of date. One of us has recently visited Boston and learnt that the operative mortality in intestinal obstruction of the newborn (excluding meconium ileus) is now in the neighbourhood of 10% in the Children's Hospital. Even in this country, where we have been backward in recognizing the value of paediatric surgical centres, the results have improved considerably. In the previously mentioned article (Rickham[1]), 23 cases of neonatal intestinal obstruction were reviewed; the mortality was 78.3%. These cases occurred in the Liverpool region during 1949, and a large proportion were operated upon in peripheral hospitals. This contrasts sharply with the mortality rate of 26.1% in 23 similar cases operated upon during 1952 in our neonatal surgical centre. Our last seven consecutive cases of ileal and colonic atresia have survived operation.

There is no doubt that occasional successes will occur in general surgical clinics, but, unless these cases are concentrated, the operative mortality of neonatal intestinal obstruction will remain high throughout the country as a whole. The improvement in the mortality has been mainly brought about by advances in the pre- and post-operative care and a better understanding of the biochemical changes which are involved. Improvement in the actual surgical technique has been of less importance. Continuously high recovery rates are impossible without the work of a team of surgeons, anaesthetists, pathologists, biochemists, and nurses specialized in this type of surgery. Such a team can only be formed in a centre. The general surgeon, unless he is trained to undertake the pre- and post-operative treatment, will always work at a disadvantage, he will have to depend on paediatricians who are inexperienced in these special surgical problems. If we are to improve the mortality associated with these conditions we will have to establish more regional centres in this country. This has long been recognized in those North American and Scandinavian countries which have left us behind in this type of surgery. Luckily, our distances are comparatively small, and three to four hours' travel would take a child from the remotest area to a regional centre, a delay which is insignificant. Babies are sent to us from distances up to 100 miles. These children travel well, provided an experienced nurse is sent with them. Delay in treatment due to distance is, in our experience, insignificant compared with the delay due to late diagnosis.

In our view the greatest advance in this type of work has been the appointment of paediatricians to outlying hospitals, This has resulted in early diagnosis and rapid transit to the appropriate centre.—We are, etc.,

ISABELLA FORSHALL.
P. P. RICKHAM.

Liverpool, 12.

REFERENCES

1 *Lancet*, 1952, 1, 332.
2 *Abdominal Surgery of Infancy and Childhood*, 1941. Saunders, Philadelphia.

SIR,—Dr. W. P. Sweetnam, Mr. F. W. Shepherd, and Dr. E. F. Murphy (*Journal*, April 4, p. 765) advocate that cases of congenital deformity of the digestive tract occurring in the abdomen should be treated by general surgeons: in other words that the system which now obtains in most parts of this country should persist. They recommend, however, that similar deformities occurring in the thoracic part of the tract should be treated in special centres; and they do not mention the very varied and difficult ones occurring in the lowest part, the rectum and anus.

In support of their argument the authors present a series of two cases, neither of which I find very convincing. The case of intestinal anastomosis survives with the grave handicap of a blind length of bowel leading off the caecum, and, as congenital defects of the bowel are often multiple, many authorities would not agree with the omission to examine the whole digestive tract. The other case was allowed to develop obstruction under the eye of the surgeon. In their references they quote Wangensteen,[1] who has been preaching for many years against delays of this kind. They also quote Ladd and Gross,[2] whose classical and most valuable work would have been impossible under the system they recommend. If the authors of the paper would investigate precisely what has happened to all the cases of deformities of the digestive tract in a definite district surrounding them over a definite space of time we should have some really valuable information, of the kind gathered by P. P. Rickham.[3] It would then be possible to compare these results with those gained in centres of paediatric surgery in Boston and Stockholm, not to mention Liverpool and London.

This is, of course, not to suggest that the authors of this paper are wrong to treat such cases; but I do think they are wrong in encouraging the average general surgeon to take on their care, and in discouraging the formation of those units of paediatric surgery which have brought the treatment of all congenital deformities to an efficiency that is far from realized by the profession at large. What I would like to see would be purely paediatric surgical units set up in centres such as Huddersfield, with young surgeons in charge of them who would take the work of these difficult and fascinating cases to a higher pitch of efficiency than is to be found anywhere at present. They would find plenty to do, and it is only by concentrating such relatively rare conditions in large numbers that a real body of knowledge of pathology, diagnosis, and treatment can be built up.—I am, etc.,

London, W.1. DENIS BROWNE.

REFERENCES

1 *Intestinal Obstruction*, 1942. Thomas, Springfield, Ill.
2 *Abdominal Surgery of Infancy and Childhood*. 1941. Saunders, Philadelphia.
3 *Lancet*, 1952, 1, 332.

SIR,—Dr. W. P. Sweetnam, Mr. F. W. Shepherd, and Dr. E. F. Murphy (*Journal*, April 4, p. 765) with the anaesthetist and nurses concerned must be congratulated on the successful surgical treatment of two premature infants with intestinal obstruction. They raise the question of who should operate on the newborn, and take a proper view that much neonatal abdominal surgery is within the competence of the general surgeon. The thoracic, the plastic, and the neurosurgeon can also play their appropriate parts, provided that the particular surgeon, anaesthetist, and staff (like the paediatrician) will acquaint themselves with the latest developments in the special field.

Clearly there is room for one or two units for intensive study of surgery of the newborn as such, even though they may not have the monopoly of valuable results. The modern trend is to demand the complete range of "extra-specialists" everywhere, on the principle that everyone must have the best. This leads to rather elaborate and possibly wasteful staffing. There is still a limit to the number of outstanding men. Let us give them full opportunity when we recognize them and learn from them what we can. And let us remember that multiplication of departments does not automatically multiply talents.—I am, etc.,

London, W.1. ALFRED WHITE FRANKLIN.

The Judet Operation

SIR,—The Judet operation is probably at the height of its popularity at the moment. Furthermore, the stimulus which it seems to have given to the marketing of newer and even more formidable prostheses may have exceeded the bounds of reason. At this stage, then, it may be fruitful to record some impressions arising from a personal series of about 50 cases. These are qualified by the fact that there must be few indeed in the country with sufficient long-term experience of the operation to draw precise conclusions about its lasting efficacy. Indeed, the only worth-while follow-up yet published is that of Judet himself, and naturally he is enthusiastic about his own operation.

The results of some 25 cases of subcapital fracture of the femoral neck treated by acrylic replacement have been at least encouraging. Apart from one death in the sixth post-operative week from bronchopneumonia, all the patients have been able to walk well (albeit with one stick), have regained full, or nearly full, movement, and have been free from pain—this in substantially less time than one usually considers a "nailing" fit to bear weight. The osteoarthritics, however, have given less cause for satisfaction. In some 28 cases, four have had a return of hip-joint pain within two years of their operation. Return of symptoms has recurred in cases where a technically satisfactory operation has been performed, and one has been at a loss for an explanation. Certain facts, however, appear to become more significant when meditating upon these indifferent results. No prosthesis can ever accurately match the head which is removed, and, as a sequel, where two bearing surfaces are not exactly congruous mechanical wear is absolutely inevitable.

With these figures and deductions in mind I now find myself, perhaps unconsciously, leaning towards the older established procedures such as arthrodesis and displacement operations of the MacMurray type. Space forbids discussion of the merits of each. Suffice it to say that, apart from its own intrinsic merits (and these are considerable), a MacMurray's osteotomy has never yet given me an ungrateful patient, and it may even become a standard method of dealing with the "failed" acrylic head. In conclusion, let us become a little less prosthetically minded and indulge in some critical thinking about this widespread joint "re-bushing."—I am, etc.,

West Hartlepool. A. WEBB-JONES.

Nicotinic-acid Deficiency

SIR,—I am very interested in the case note published by Dr. G. H. Collins in his letter (March 28, p. 731), for it corroborates observations of my own[1] regarding the importance of high blood concentrations of vitamins in various clinical conditions. In such instances vitamins are no longer used as dietary supplements, nor can they be adequately regarded as catalysts. It is tempting to consider them as metabolic reagents having metabolic cycles of their own which, however, have not so far been described.

There is a further comment I would wish to make regarding the use of nicotinic acid in the dose of 1,500 mg. mentioned by Dr. Collins. In my experience, even as little as 50 mg. intravenously may produce intense abdominal pains, and furthermore subjective discomfort may be most severe owing to vasodilatation. Quite marked blood pressure alterations and other signs of autonomic disturbance may occur if large doses of any single vitamin are given directly into the blood stream. In so far as Dr. Collins's case showed a syndrome highly suggestive of nicotinic-acid deficiency, it is almost certain that the other members of the "B-complex" were insufficiently present. My own experience has led me to prefer a mixed barrage of vitamins, and always to use nicotinamide rather than nicotinic acid where possible. Although I have not treated a case exactly comparable to Dr. Collins's, results obtained by a colleague and myself in the treatment of acute alcoholic and toxi-infective psychoses are in preparation for publication. We have successfully used variations of the mixture of vitamins mentioned in the paper quoted—namely, dextrose, 10 g. (10% solution): aneurin hydrochloride, 1,000 mg.; nicotinamide, 200 mg.; pyridoxin, 200 mg.; and ascorbic acid, 1,500 mg.

Of course, in the presence of clinical signs suggestive of a marked single vitamin deficiency, the corresponding agents should be given in greater amounts.—I am, etc.,

London, W.1. JONATHAN GOULD.

REFERENCE

[1] *Lancet*, 1953, 1, 570.

Intravenous Detoxication of Drunkenness

SIR,—Dr. Peter Nobes (*Journal*, April 11, p. 836) is of course quite right in stating that the quelling of a drunken patient by intravenous barbiturates (as recommended by Dr. A. H. Bartley (*Journal*, January 17, p. 163)) is potentially dangerous, but, where intravenous injection is feasible, why not detoxicate instead of appease? It is not generally known that high-dosage multiple-vitamin intravenous injection not only gets rid of the excitement but of every other symptom of intoxication, and will even dispose of delirium tremens in a matter of hours. This method, which also applies to other "toxic" psychoses, was first used in 1942, and (like convulsive treatment) gradually improved. It is fully described and documented in Dr. J. Gould's recent article.[1]

Detoxication does not of course cure the alcoholic, but helps to bring it home to him that subsequent curative treatment is possible.—I am, etc.,

Isleworth, Middlesex. H. PULLAR-STRECKER.

REFERENCE

[1] *Lancet*, 1953, 1, 570.

SIR,—When a casualty officer I was not infrequently faced with the problem of the acute alcoholic. I had heard that those of my colleagues who prescribed vitamin B_6 for post-radiation sickness swore to its effectiveness as an antidote to the alcoholic hangover. I therefore tried an intravenous injection of 50–100 mg. The results were far more dramatic than I had anticipated, and of the same order as the giving of intravenous glucose to a patient in the aggressive phase of hypoglycaemia. A typical case was a woman of 45 brought in singing, swearing, and staggering. Three minutes after an intravenous injection of 100 mg. of vitamin B_6 ("benadon") she became quiet, apologized for the trouble she had caused us, and asserted she felt quite sober. She was able to walk across the room perfectly steadily.

My series was only about six cases in all, but the results were uniform, and it does appear to me that vitamin B_6 is a specific antidote to alcohol. As an analeptic to general anaesthetics, at any rate in the dose of 100 mg., it appears to have little effect. I feel that this treatment is more physiological than the use of sedatives, and may possibly be of some use in making the diagnosis between drunkenness and head injury. I should be interested to hear if others have had experience of this method of treatment.—I am, etc.,

Thornton Heath, Surrey. V. P. WORDSWORTH.

Banishment of Bromides

SIR,—I feel that those doctors who have had years of experience of the great value of bromides should not let the banishers have things all their own way just because of lack of time, or lethargy in putting pen to paper. I refer especially to the article (*Journal*, March 28, p. 694) in which Professor D. M. Dunlop and his colleagues give a survey of prescribing in Scotland in 1951 and state: (1) "Bromides seldom prove more effective than phenobarbitone either as sedatives or as anticonvulsants. Their frequent side-effects and the undesirable cumulative toxic effects which result from their prolonged administration relegate bromides to the group of drugs which should largely be discarded in modern therapeutics," and (2) "Bromides are sedatives which have to be administered frequently before there is a sufficient replacement of chloride by bromide ion to exert a depressant effect on the central nervous system, and their occasional administration with a hypnotic such as chloral has no more effect than a dose of salt water."

There is undoubtedly truth in the first part of the first statement, but the conclusion is hardly justified. The effect of sedatives is extraordinarily individualized, as one realizes more and more the longer one has experience of them. One patient of nervous type with disseminated sclerosis went through seas of trouble on various daytime sedatives until I went back to a bromide and chloral mixture, of which a small or medium dose was taken as required. The patient had previously been doing reasonably well on it, but an exacerbation of the disease occurred, and in deference to modern views I decided to try without the mixture. We persevered for a long time with various barbiturates, etc., during and after the exacerbation, but a return to the bromide and chloral mixture made it quite clear that it was the best daytime sedative for the case. The second statement I can only regard as incorrect. Doubtless some neglected factor in the experiments will be found, as happened with the contention that ergot by the mouth was ineffective. I can cite other patients who get exactly the mild daytime sedation they may require from a small dose of bromide alone, either occasionally or repeated for a few days; it has always worked so well that there has been no justification for change.

The late Dr. Alfred Parsons, a well-known Dublin teacher, gave outstanding credit to the value of small doses of sodium bromide in many, if not most, of the ills that flesh is heir to. The late Sir Maurice Craig, of London, held, I believe, a similar opinion. It would seem a pity for young doctors to fight shy of old and most helpful remedies because of modern pronouncements perhaps not based on a thorough personal experience with the drugs condemned. It is relevant to recall that quite a number of patients are intolerant to phenobarbitone, and that it is slowly excreted and can also accumulate in the system.—I am, etc.,

Portadown, Co. Armagh. ROBERT E. HADDEN.

The Backward Child

SIR,—Having worked in the Fountain Hospital in 1948, and at that time having been impressed by Dr. B. H. Kirman's open-minded approach to the problem of mental deficiency, I greatly enjoyed his letter (*Journal*, February 7, p. 334).

Like Dr. D. Jackson (*Journal*, March 7, p. 559), I agree with Dr. Kirman that a final diagnosis regarding educability should be postponed as long as possible. To Dr. Jackson's statement that educability will largely depend on "advances in psychology and education" I want to add "and on advances in medicine." By this I mean on new findings in brain pathology which have to be combined and synthesized with findings of brain anatomy and of brain physiology to bear upon the concept of mind. Medical research should lead the way in demonstrating what different integrative actions of the brain are involved in solving various intelligence tests. Analysing a great number of such tests, I found every single one resting basically on integrations of the visual or the auditory sense with either proprioceptive or interoceptive impulses.

It is a well-known fact that visual and auditory nerve fibres are integrated with proprioceptive fibres in the superius and inferius corpus quadrigeminum. It is at present only a well-founded hypothesis that visual and auditory impulses are integrated with interoceptive impulses from the hypothalamus in the corpus geniculate laterale and mediale.

In a report for the Ministry of Health, published in 1922 by H.M. Stationery Office, Eardley Holland described his findings in the brains of almost 100 stillborn children. He found in every case a massive haemorrhage, which "could be pinned down within narrow limits . . and corresponds to the course of the vein of Galen." The blood coagulum pressed on the lamina quadrigemina and against the caudal end of the thalamus—that is, against the corpora geniculata and the pulvinar. A number of other researchers have since confirmed the correctness of Holland's findings and the enormous frequency of these haemorrhages in stillborn children and in young infants who died from intercurrent diseases during the first year of life. Holland posed the question: "As these injuries are so frequent and probably in most cases *not* fatal, what happens to the children who survive?" Strangely enough, nobody has tried to answer this question by investigating the brain stem in diseased aments. The explanation is probably that nobody considered the likelihood of an intellectual defect originating in the lowest brain region, a region which is almost identical in all vertebrates from fish to man.

Clinical and brain pathological studies in the field of mental deficiency during the last eight years have enabled me to collect a large amount of clinical data and a lesser amount of pathological data which might help to answer Holland's question. My findings and observations strongly support the theory that pathological changes in the above-mentioned ganglia and in their afferent and efferent tracts may play one of the most important roles in the causation of mental defect. Organic disturbances in one or several of these structures will—according to their severity—disturb more or less severely a child's visual or auditory reflex activity, either somatic or autonomic. At the same time, these disturbances will deprive the cortex of necessary sensory-somatic or sensory-autonomic impulses. This loss will create more or less distorted concepts of reality in the mind of an afflicted child.

Analysis of the individual scoring patterns in intelligence tests makes it possible to gain a fairly good impression of the special functional disabilities of a mentally handicapped individual. Neurological examination designed to reveal disturbed visual and auditory reflexes have to supplement the diagnosis of visuo-somatic, auditory-somatic, visuo-autonomic, and auditory-autonomic impairment. We often find a combination of two, sometimes even of three or four, disorders. On the basis of such a diagnosis educational treatment can be instituted. Following the example set by the development of blind and deaf teaching, new educational procedures and new educational tools have to be devised. These have to be designed to make use of intact pathways into the cortex so as to supply the mind with undistorted information. Adequate stimulation, mentioned by Dr. Jackson, originates in this undistorted information.

At Columbus State School in Ohio we are presently engaged in a research project based on the above considerations and designed to develop the dormant intellectual potentialities of 20 ineducable children, aged 6 to 8 years, with I.Q.s between 30 and 50. In contrast to English usage, Americans regard an institution for backward children as—to use Dr. Jackson's words again—"an educational establishment, that is, school."—I am, etc.,

Columbus, Ohio. LISE GELLNER.

Pilonidal Sinus of the Suprapubic Region

SIR,—We have read with interest the medical memorandum by Mr. Roderick G. MacLeod (*Journal*, March 28, p. 710) entitled "Pilonidal Sinus of the Suprapubic Region." In this he states that pilonidal sinuses have been previously described in the axilla, the sacro-coccygeal region, the perineum, barbers' hands, the sole of the foot, and the umbilicus, and adds a seventh site, the suprapubic region.

As we have seen several cases of sinuses in barbers' hands within recent months and intend to publish a review of this condition shortly, we are interested not only in hair-bearing sinuses in any situation but also in the nomenclature presently in use. The term pilonidal sinus, which is descriptive only and has no histiogenetic or aetiological basis, was used first by Hodges[1] and applied by him to the post-sacral type. It is of interest that he was aware of the lesions occurring in barbers' hands and did not apply the term pilonidal to these. Patey and Scarff[2,3] have recently drawn attention to this occupational disease of barbers, and have suggested that the mechanism of formation of the post-anal pilonidal sinus may be similar to that of the barbers' lesion. Although we feel that there is much to be said in favour of the congenital theory in the production of the post-anal sinus, it is suggested that the purely descriptive term of post-anal pilonidal sinus be used and not that of post-sacral dermoid, as its real nature is still in doubt. In cases where a sinus has arisen as a result of rupture of an infected dermoid cyst—one of us has recently seen one on the nose—it is surely unnecessary and wrong to give it a name which is only descriptive, when the true pathology is known.

Finally, in the case of the sinuses of barbers' hands, it is well established that the lesion is produced by the tissue reaction to extraneous hairs and not to the hairs of the

host. There are no hair follicles in the sinus wall, and the lesion arises as a result of penetration of the epidermis by short sharp hairs from the heads of males, the setting up of a foreign-body reaction to them, and secondary infection. It is therefore again preferable to name such lesions "interdigital sinuses of barbers' hands," rather than use the confusing term "pilonidal sinuses."—We are, etc.,

A. R. CURRIE.
THOMAS GIBSON.
ARCHD. L. GOODALL.

Glasgow.

REFERENCES

1 *Boston med. surg. J.*, 1880, **103**, 485.
2 *Lancet*, 1946, **2**, 484.
3 Ibid., 1948, **2**, 13.

SIR,—Neither history nor histology supports Mr. R. G. MacLeod (*Journal*, March 28, p. 710) in applying the term pilonidal sinus to a suppurating and discharging dermoid cyst. The term pilonidal sinus was coined by R. M. Hodges[1] in 1880, and he described the condition in the following words: "On exposing its interior by an incision, a certain quantity of pus is evacuated, and a lock of loose hair is found occupying the space, more or less matted and curled, and of varying size and amount. The hairs of which it is made up are always short, without bulbs, and correspond in colour to those of the patient. The cavity containing them has no cyst or lining membrane, or other characteristic suggestive of a congenital dermoid wen; merely the granulating walls of an ordinary suppurating sinus, with no trace or suspicion of hairs growing from its surface, or of isolated spots of cuticle from which they might have been shed."

It is remarkable that in the face of such evidence as this the developmental or endogenous theory of a pilonidal sinus should have become widespread. The champions of this theory have been hard put to it to explain the conspicuous absence of an epithelial lining from the main cavity of a pilonidal sinus and have had to fall back on the argument that the epithelium is destroyed by the suppuration. Mr. MacLeod's interesting case has spiked this gun by showing that when there really is an epithelial lining it can withstand repeated suppuration for as long as two years. It is time the endogenists surrendered.—I am, etc.,

B. H. PAGE.

Enfield, Middlesex.

REFERENCE

1 Hodges, R. M. (1880). *Boston med. surg. J.*, **103**, 485.

Myxomatosis in Control of Rabbits

SIR,—I was interested to see in the *Journal* (March 21, p. 639) the brief note about the satisfactory effects of myxomatosis in the destruction of rabbits in Australia. I think there should have been included some reference to Dr. H. de B. Aragão, of the Instituto Oswaldo Cruz in Rio de Janeiro, who first suggested its use for rabbit control in 1928. His work and the parts played by American and British workers are briefly summarized in an article by Liversidge in *Discovery*.[1]—I am, etc.,

C. J. HACKETT.

London, N.W.1.

REFERENCE

1 *Discovery*, 1952, **13**, 191.

Cancer and Organic Content of Soil

SIR,—Dr. E. H. Eason (October 25, 1952, p. 941) considered it misleading to mention organic manure in relation to plant copper deficiency. I can find no substantiation for this, since it appears from the literature that the factor involved is simply the power of organic matter to fix copper in a form unavailable to plants. The other soil conditions mentioned by Dr. Eason are not relevant here, important though they are in agriculture. On the other hand, Dr. E. D. Allen-Price (October 11, 1952, p. 831) finds excessive gastric cancer mortality in an area of intensive cultivation in his region.

I have therefore examined data[1] for one area where exceptionally heavy organic manuring has long been practised—the Biggleswade and Sandy area of Bedfordshire. It has been observed that this area "seemed conspicuous for the malignity of cancers of all sorts."[2] Total cancer mortality, standardized for the experience of all Bedfordshire (age, sex, type of district), is given below.

District	Expected	Actual	Ratio %
Biggleswade R.D. ..	175	199	113
,, U.D. ..	64	63	99
Sandy U.D.	31	43	139
Aggregate	270	305	113

Soil samples from cultivated land in the area gave an ignition-loss figure of 8.2%; from heaths and woods, 6.0%. From this it would seem that heavy organic manuring does induce the "total cancer factor," despite rapid humus turnover. From other evidence too lengthy to give here I suspect that a protective factor exists in normal vegetables, which is depressed by copper deficiency. It may be a product of tyrosine oxidation, though this is problematic. If this deduction is correct, then a simple agricultural operation can increase human resistance to carcinogenesis. Indeed, in areas where micronutrient fertilization is essential for adequate crops, farmers may now be preventing cancer. How true to historical form!

So long as the malignant mutation remains irreversible, active prevention is the best hope.—I am, etc.,

C. D. LEGON.

London, S.W.17.

REFERENCES

1 Harvey, C. A. (1953). Personal communication.
2 Gordon-Taylor, G. (1939). *The Practitioner*, **143**, 21.

Agriculture (Poisonous Substances) Regulations

SIR,—I would refer to your annotation in the *Journal* of March 28 (p. 717) on Agriculture (Poisonous Substances) Regulations, S.I. 1953, No. 358. The last paragraph of the annotation contained the following comment. "They [the regulations] are open to criticism for the reliance they place on the wearing of face-shields rather than full face respirators. The main route of absorption is through the lungs, and face-shields do not prevent absorption by this route during spraying operations. They are likely to be particularly ineffectual when organo-phosphorus compounds are used in an enclosed space such as a greenhouse."

This criticism is hardly justified, and suggests misinterpretation of the regulations. The regulations rightly distinguish between the dangers from the specified substances when they are suspended in the atmosphere in an enclosed space and likely to be absorbed in the lungs, and when in the form of coarser droplets which are rapidly deposited. In the former case the use of a full-face respirator is specified in the regulations (see First Schedule, Part II, item 7, and Regulations 4 (2)), in the latter a face-shield only is required.—I am, etc.,

W. A. WILLIAMS,
Secretary,
Association of British Insecticide Manufacturers.

London, W.1.

Attempted Suicide by Burning

SIR,—Mr. R. J. V. Battle and Dr. H. E. S. Marshall's case record of an attempted suicide by burning (*Journal*, December 27, 1952, p. 1397) recalls a patient who is at present undergoing treatment for a like condition.

Two years ago a 15-year-old girl poured paraffin over her clothes and set them alight. She suffered severe burns of the right side of face, neck, front and back of chest, axillae, right forearm, and hand. On healing, severe contractures were formed on the neck and axillae. She is one of eight daughters; and, according to a local attitude to which her family adheres, this is considered a misfortune. She was denied any parental affection, and besides the scorning by her father she was often beaten. She has had limited schooling. Following the healing of the burns, she has attended a psychiatric centre in Jerusalem, but at all times, according to their records, she maintained a reticence about her deeds.

While under plastic surgical treatment, which is of necessity a lengthy one, she is proving very co-operative. The abdominal flap is already in position on the neck, and the favourable result

thereof seems to have produced a marked psychological improvement in the patient. Suicide by burning among the peoples of the Middle East is apparently not infrequent.

I wish to thank Mr. Jack Penn for his advice in planning the plastic procedures on this patient.—I am, etc.,

Haifa. B. HIRSHOWITZ.

Liver Injury by Antibiotics

SIR,—Attention has been drawn in your annotation (*Journal*, April 4, p. 777) to reports of changes seen in liver tissue associated with a large dosage of antibiotics. The comment has been made that "this evidence from human and animal studies shows that aureomycin, and probably terramycin, are mildly injurious to the liver when given in large doses, especially parenterally."

Among the references given, as regards terramycin, Lepper *et al.*[1] reported the effects of large doses of antibiotics on the livers of mice. They found that "the effect of terramycin was similar to that of aureomycin, although less marked." They also emphasized that the dosages of both antibiotics were much higher than those which are recommended for the treatment of human infections. Nevertheless, the very mildness of the possible liver injury subsequent to excessive antibiotic therapy is summed up in the first article quoted in the annotation[2]: "Excessive amounts administered therapeutically, for instance, may act in a manner analogous to that of excessive amounts of dextrose given by the intravenous route." Again, in the same article, the authors considered that the liver damage would seem to be reversible if administration of the drug was stopped soon enough. The seven patients in this article are reported as having shown definite clinical signs of liver damage after aureomycin, but the authors emphasize that six of them, from whom they had obtained liver tissue for examination, had evidence of potential or demonstrable liver damage prior to any treatment.

Lastly, the discovery of the structural formula of terramycin has shown it to be both unique and devoid of dangerous chemical radicals which are known to provoke serious toxic reactions. This new knowledge helps to explain the high degree of safety of the drug, an experience which has been amply confirmed by many thousands of clinical trials in which terramycin is shown to be free of toxic effects in blood and blood-forming organs, liver, heart, and other vital organs.—I am, etc.,

Folkestone. R. K. PHILLIPS, Director of Medical Services, Pfizer Ltd.

REFERENCES

1 *Arch. intern. Med.*, 1951, **88**, 284.
2 Ibid., 1951, **88**, 271.

SIR,—In your annotation on "Liver Injury by Antibiotics" (April 4, p. 777) you state that the evidence from human and animal studies shows that aureomycin and probably terramycin are mildly injurious to the liver when given in large doses parenterally, and that there is a remarkable absence of such toxicity when given orally in the usual dosage.

Lepper and his associates in the paper which you quote[1] mention that the dosages of aureomycin which produced evidence of liver dysfunction in patients were excessive. Lepper further states that intravenous doses of aureomycin totalling less than 2 g. a day were not accompanied by evidence of liver dysfunction or injury. In more than 1,300 patients to whom they administered aureomycin orally, no evidence of liver injury was noted.

Kalz and his co-workers[3] and Knight *et al.*[3] have found aureomycin useful in chronic liver diseases and particularly in the chronic residua of acute hepatitis. It appears also to be of definite value in hepatic failure and in the fulminating type of acute hepatitis (Kimbrough[4]).

Long[5] states that every year since its introduction the dosage requirements of aureomycin have been decreased and are now about 50% less than those suggested two years ago. The present recommended dosage of aureomycin of 12 mg. per kilo of body weight, or 1 g. daily for the average adult, does not produce injury to the liver.

However, your annotation emphasizes the possible ill-effects of administering doses of antibiotics parenterally in excess of therapeutic requirements, and is a timely warning on the misuse of these substances.—I am, etc.,

London, W.C.2. A. T. MENNIE, Medical Director, Lederle Laboratories Division, Cyanamid Products, Ltd.

REFERENCES

1 *Arch. intern. Med.*, 1951, **88**, 271.
2 *Canad. med. Ass. J.*, 1949, **61**, 171.
3 *J. clin. Invest.*, 1949, **28**, 1052.
4 *J. Tenn. med. Ass.*, 1951, **44**, 412.
5 *Trans. Amer. Acad. Ophthal. Otolaryng.*, 1951, 524.

"Efocaine" and the Relief of Pain

SIR,—Referring to Dr. T. H. Howell's note (*Journal*, April 4, p. 785) giving his results with "efocaine" for the relief of pain in fibrositis, my personal experience is that the chemical constitution of the solution injected is quite immaterial, provided that all the myalgic spots where the pain originates are successfully located. The relief then given should last for months.

In a recently published series[1] I described a carefully controlled experiment in which the objective effect of injecting normal saline was the same as that of injecting procaine. The advantage that normal saline has over any of the anaesthetic solutions of which procaine is the prototype lies in the fact that there is never any reaction. For the last two years I have used nothing else.—I am, etc.,

London, W.1. H. WARREN CROWE.

REFERENCE

1 *Lancet*, 1952, **2**, 1133.

The Metric System

SIR,—I have read with great interest the correspondence on the metric system. I have been working in Zurich for two years, and therefore have had ample experience of the practical side of this question. I can wholeheartedly agree with the opinions expressed by Dr. C. Langton Hewer in his letters (*Journal*, February 21, p. 450, and April 4, p. 782), and Dr. John Primrose (*Journal*, April 4, p. 782) seems to have arrived at the happy compromise. My personal experience is that in practice it is by no means the excellent system that theory would lead one to expect.

When the dosage is in grammes the metric system works well, but when it is in milligrams or fractions of milligrams then it is often corrupted and becomes confusing. For example, when I wish to order 1/150 gr. I must say to the sister the equivalent of: "Please give nought comma nought nought nought five" (this is an approximation, 1/150 gr.= 0.00044 g.). For some reason of habitual usage I cannot say the equivalent of, "Please give half, or 0.5 mg.," or confusion might be worse confused. 1/100 gr. is 0.0006 g., but who would argue that the mental picture of the difference between 1/150 gr. and 1/100 gr. is not more quickly appreciated than the metric 0.00044 g. and 0.0006 g. ?

The difficulty is largely overcome here by the simple but very undesirable system of ordering drugs in "whole ampoule" or "half ampoule." Apparently this is a local expedient to overcome the practical difficulties, adopted by those who have been brought up on the metric system all their educational lives. The disadvantages and, indeed, dangers of such an expedient are self-evident.

Touches of the magic wand of mathematical nicety cannot change human mental processes. Ever since the days when we were little boys and girls and gave our playmate half an apple (and gave or kept the "bigger half" for ourselves) fractions will have a clearer mental picture for the average adult than a metric system. So far I have never heard my small son come in and say: "Daddy, Hans gave me 0.5 of his apple." And in our hospitals we must work with the average practical individual who gets on with the work, rather than the adherents of a beautifully correct mathematical system.—I am, etc.,

Zurich. R. A. C. HERRON.

The Medical Practitioner and the Law

SIR,—The time has come for the medical profession to recognize the double threat inherent in the growing tendency for dissatisfied patients to bring an accusation of negligence against a doctor and/or his hospital. The present tendency is due partly to the impersonal element introduced by the National Health Service, and partly to the financial immunity of certain claimants because of the legal aid system.

The first part of the threat is against the faith of the public in their doctor. Obviously the more often doctors are declared to have been negligent the less faith the public may reasonably put in them. The second threat challenges to some extent the freedom of the practice of medicine. It is again obvious that, if the doctor is gradually forced to give only such treatment as can be defended safely in a court of law should any unforeseen or unavoidable complication arise, then progress in medicine will be deterred.

Although it is the public who ultimately stand to lose by these processes, it is nevertheless our duty to counter them. It seems to me that it is desirable for members of our profession to take particular care that they do not yield to the temptation to support on slender grounds a claim of negligence against a fellow practitioner. Where a medical man finds himself faced with the invidious duty of saying whether a colleague has been negligent, he should not shrink from that duty. He may feel that he has a responsibility to assist the course of justice and he must discharge it. The medical profession does not wish, even were it possible, to set itself above judicial criticism or beyond reproach. But the doctor who has to give his opinion as to negligence should be satisfied that there are facts on which he can base this opinion. He must remember that medicine is not an exact science, that assumption and conjecture about patients whom he has not seen and about whom the facts are uncertain are completely unreliable. Conjectures, assumptions, and hypotheses are not sufficient grounds on which to give a responsible and honest opinion that a colleague has been negligent.

One hears that a doctor giving evidence as an expert witness in one of these cases said "there must have been" such and such a sign: "there would obviously be" such and such a symptom. What nonsense! Human reactions are not so consistent as that. I have myself heard a medical witness in such a case base his allegation of his colleague's negligence on a series of three postulates, the second of which was impossible, the third highly unlikely, and the first, on which his case rested, was contrary to the evidence that his colleague had given on oath. And I have seen the same witness feed his counsel assiduously with material intended to trip, to confound, and to discredit medical witnesses for the defence, even including sisters and nurses. I felt ashamed when I saw it. If one holds views it is obviously reasonable occasionally to pass a note or a suggestion to the counsel who is putting those views, but to keep up a continuous stream of suggestions in which every possible attempt is made "by hook or by crook" to catch out a fellow practitioner is really carrying zeal too far. And it is all eventually to the discredit of the profession and to the public harm.

I suggest, Sir, that not only should the Ethical Committee of the British Medical Association peruse a full and complete transcript of the evidence in these cases, but also that the pertinent parts should be printed in your *Journal*.—I am, etc.,

Liverpool, 1. BRYAN MCFARLAND.

SIR,—Mr. G. A. Craig (*Journal*, March 14, p. 618) deserves credit for his comments on the current spate of anti-medical litigation, and particularly the alarming measure of success with which these efforts have been attended.

There would appear to be an unpleasant current tendency for the patient to regard his doctor with a mixture of suspicion and hostility, so that when something goes wrong recourse to the Courts for retribution follows naturally. While no one is immune from the attacks of these factious malcontents, it is clear that both eminence and experience afford considerable protection, and so it is that the more vulnerable younger practitioners must bear the brunt of the assault. Hospital residents appear to be popular targets, and, while some are sheltered by their consultants, the unfortunate casualty officer, who is constantly exposed to difficult and dangerous decisions, is often unowned and unsupported. He is in fact a "sitting duck," and entirely at the mercy of the aggrieved bereaved. No sane practitioner could claim that mistakes are entirely unavoidable, and it is obvious that the less experienced a man the more often will he be in error. Casualty posts offer the type of experience and remuneration that will appeal mainly to the recently qualified practitioner, whose judgment will of necessity be immature.

We were taught that, provided we exercised reasonable care and a degree of skill compatible with our experience, we were not generally responsible for unfortunate sequelae. However, it is apparent that the exercise of care and skill is no longer a safeguard; and a combination of free law and free medicine is breeding an insupportable doctrine that because someone dies someone must, therefore, have been negligent. A startling illustration of the development of this new concept of negligence is afforded by the outrageous Payne case, which appeared to the majority of the medical profession to be a travesty of moral justice.

While it is undoubtedly comforting to be in a position to face litigation secure in the knowledge that our expenses will be met by our Defence Society, there are few who are satisfied with this purely defensive strategy. Further mischievous and malignant actions must be met with vigorous and uncompromising resistance by the bodies concerned with the legal protection of the profession, so that our safeguard against the consequences of natural and ungovernable phenomena is restored.—I am, etc.,

Northampton. T. T. E. MICHAEL.

Vitamins

SIR,—Professor D. M. Dunlop and his colleagues in the "Survey of Prescribing in Scotland in 1951" (*Journal*, March 28, p. 694) estimate that in the United Kingdom about two million pounds are spent in the prescribing of vitamins by general practitioners.

This practice is merely an emulation of the widespread use of vitamins in hospital. In the wards of a teaching hospital wherein I worked recently vitamin tablets and iron tablets were issued routinely with each meal, irrespective of whether any specific deficiency was thought to exist.

This costly custom in practice and in hospital assumes that our food is devitalized and deficient. The increasing incidence of diseases of degeneration, viewed in the light of the pioneer work of Sir Robert McCarrison, surely indicates that this assumption is correct. But to attempt to supplement a deficient diet by using the torrent of synthetic products poured out by enterprising chemists is futile, costly, and illogical.

As long as a large proportion of our food is processed, desiccated, and canned our tissues will continue to degenerate, our hospital waiting-lists will be long, and our consulting-rooms full. Those who doubt this statement should study the Cantor Lectures delivered by McCarrison in 1936 and now published under the title *Nutrition and National Health* (London, 1953).

Only a complete reform of our food production and manufacture, beginning with the abolition of the milling of low extraction wheat flour, will restore the health and vitality of the population and make unnecessary the wasting of millions of pounds in worthless prescribing.—I am, etc.,

Aberfeldy, Perthshire. W. W. YELLOWLEES.

SIR,—It is very difficult to be strictly scientific in our approach to medicine, though the modern tendency seems to be that way. I assume that Dr. A. Lewis (*Journal*, March 28, p. 729) never gives penicillin without first ascertaining that the organism responsible for the illness he is treating is penicillin-sensitive, and never uses any of the still commonly prescribed "expectorants" because clever scientific doctors say they serve no useful purpose. It happens, though, and not infrequently, that experience is a

better guide than the test-tube or microscope, and experience has shown that in early childhood and in pregnancy, as Dr. Lewis admits, and in soldiers on active service, vitamin supplements are of value. Such supplements have been regularly used for many years as part of the routine training diet of undergraduates undergoing the very severe physical training necessary before rowing in the Boat Race. There are no statistically significant figures available, but it seems that the incidence of coughs, colds, influenza, and minor infections generally is lower among the selected few who undergo Boat Race training at Cambridge than among the common undergraduate population. Of course, all sorts of other factors are involved, and the conclusion that vitamin supplements "help" is grossly unscientific. However, it is likely that Cambridge Boat Race crews will continue to use these extra accessory food factors.—I am, etc.,

Cambridge. E. V. BEVAN.

SIR,—It is astonishing that Dr. A. Lewis, who is so ready to challenge (*Journal*, August 23, 1952, p. 445) statements in the daily press, should be unfamiliar with scientific advances in the study of vitamins during the last two decades. The point of view made in his letter (*Journal*, March 28, p. 729) represents opinions current at least 20 years ago, when little was known of the exact physiological needs for vitamins. The situation is different to-day. While recognizing that requirements vary from individual to individual, we can now make estimates within relatively narrow limits of human daily needs, and can with a good measure of accuracy assess the intake from food.

From the Ministry of Food publication (1952) *Domestic Food Consumption and Expenditure, 1950*, we learn that the average intake of vitamins for all households was above the standard set by the B.M.A., but average values are misleading unless we recognize that they are obtained by the combination of levels below with levels above. It would be reassuring to think that food provided in our universities could always be depended upon to give students protective nutrients up to or above their estimated needs. But can we be sure of this? In a college where special studies are made of nutritional problems 20% of a group of students were found in 1948 to be deficient in vitamin A (Miss Stella Doraiswami and Professor John Yudkin, *British Medical Journal*, 1948, **2**, 708).

Cambridge at any rate has decided to err on the side of safety. Dr. Lewis says "vitamins . . . are especially valuable where there is fear of vitamin deficiency." This surely is a justifiable fear. The problem could be settled by an analysis of the food eaten before and during training, when the extent of supplementation by vitamins could be determined with some measure of accuracy. This is, in fact, done by members of the Oxford University Exploration Club, who also take care that they are not short of vitamins.

Dr. Lewis asks for an official statement on the limitations of vitamins. The Report of the B.M.A. Committee on Nutrition, 1950, gives the most recent estimates of needs, and the Ministry of Food's recent new edition of the *Manual of Nutrition* aptly mentions on p. 38 that "shortage of water-soluble vitamins B_1, C, and riboflavin will also take some time to become evident. Then slothfulness, malaise, and minor skin troubles may arise." It would surely be folly on the part of a trainer to wait until these become manifest in his crew before taking steps to prevent such an occurrence.—I am, etc.,

Medical Research Department, Vitamins Ltd., London, W.6. AUDREY Z. BAKER.

Crohn's Disease Involving the Stomach

SIR,—The literature in Crohn's disease is extensive, but case reports of the lesion involving the stomach are rare, which gives added interest and importance to the two cases of Mr. F. R. R. Martin and Dr. R. J. Carr (*Journal*, March 28, p. 700). In claiming priority of proof of gastric occurrence I think they must be unaware of the short series of Comfort *et al.*[1] that included "the first case report of a lesion in the stomach identical with regional enteritis and confirmed by pathological examination." The present authors emphasize the diagnostic role of anorexia and vomiting, regarding these symptoms as pointers to the involvement of the stomach in the absence of stenosis of the intestine. Some clinical experience of the disease finds one at variance with this interpretation. In the first place, anorexia and vomiting do occur in typical Crohn's disease apart from obstruction, and are usually accompanied by pain in the epigastrium or lower abdomen. Indeed, it is often pain which is responsible for the development of anorexia, because the patient is afraid to eat. Aggravation of the pain by food is a characteristic and very real feature, so much so that one man remarked that he preferred "aspirins and brandy" to a meal.

Further, it is hard to follow the authors in their view that there is danger of a gastric lesion being overlooked through lack of attention. Surely the routine barium meal *x*-ray examination of the gastro-intestinal tract should suffice to reveal any morbid changes in the stomach wall. That they are rarely described is due, I believe, to the fact that they are rarely present, and not to oversight. A comment on the radiological appearances in these two cases may not be amiss. If we accept the consensus of opinion that an infection—slow, chronic, and as yet unproven—is an aetiological factor then it would seem a fair assumption that an acute (allergic) gastroduodenitis has flared up in this segment previously sensitized to the infective agent—that is to say, an acute-on-chronic reaction. The effect on the mucous membrane would be a necrotizing one, and the necrosis of the mucosa would account for the disappearance of the mucosal folds, even as the inflammatory reaction causes an arrest of peristalsis. With the subsidence of the inflammatory attack peristalsis returns, and regeneration of the epithelium restores the normal mucosal pattern. Some support for this allergic theory is derived at laparotomy when one has seen spasm of the pylorus and of segments of the colon, a characteristic of sensitized plain muscle. A similar explanation can be applied to the phase of the lesion commonly described as "acute ileitis," which represents an allergic exacerbation in a segment of intestine already sensitized to an infection of unknown origin.—I am, etc.,

Ashton-under-Lyne. F. G. RALPHS.

REFERENCE

[1] Comfort, M. W., Weber, H. M., Baggenstoss, A. H., and Kiely, W. F. (1950). *Amer. J. med. Sci.*, **220**, 616.

Sympathetic Nerves and Eclampsia

SIR,—Obstetricians generally must welcome Mr. G. W. Theobald's article (*Journal*, February 21, p. 422), especially as it detailed the successful outcome of pregnancy in three patients who hitherto had failed to secure a live child. Even making allowances for the fact that recurrent toxaemia does on occasion fail to repeat itself in a pregnancy, or proves itself milder, the significance of his therapeusis in the survival of the foetus is manifest.

It is unlikely, however, that the reasons he has advanced for the effectiveness of his procedure will remain unchallenged. Although preliminarily he emphasizes the fact that toxaemia of pregnancy is a non-recurrent condition, he subsequently includes under this broad designation three cases (A, B, and C), on which his conclusions have been founded, which should have been more specifically classified as two cases of toxaemia complicating essential hypertension and one case of toxaemia associated with chronic nephritis. The absence of cardiovascular and of renal signs must be viewed against the genetic background and the reasonably predictable after-history of this group of patients. Pickering[1] states: "Essential hypertension . . . probably represents an inherited abnormality. . . . The beginning and middle part of the course are still largely hidden; it is during this period that pregnancies may occur as a series of events which may or may not influence permanently the hypertension." Browne[2] in reviewing his experience regards 25% of all toxaemias as belonging to this group. Mr. Theobald's three cases cannot be classified outside it either.

Further, it will be observed that Cases A, B, and C all had certain afferent nerves arising from the uterus interrupted when

the internal iliac vessels were injected with phenol. Cunningham[3] states that all blood vessels "are accompanied by nerve fibres both medullated and non-medullated, some of which are afferent and some motor." Such injection must have helped to effect a degree of uterine denervation which, in Cases B and C, was well-nigh completed by presacral neurectomy. The result of practically complete denervation in Cases B and C was in marked contrast to that of the incomplete in Case A. The latter patient gained 3 stones (18.9 kg.) by the 37th week, and her blood pressure of 120/74 mm. Hg had risen to 150/90 in the same period. The water retention reflected in her weight gain and the raised level of her blood pressure proclaimed the toxaemic process, which had not advanced sufficiently, however—for example, systolic level of 160 mm. Hg—to provoke albuminuria or to injure the foetus. Case B, whose uterus had been largely denervated, appeared to be free from toxaemic stigmata. Case C—of severe chronic nephritis—whose kidney function was perilously perched indeed, escaped disaster and thereby helped to prove the value of uterine denervation. Although Mr. Theobald omits to mention the specific gravity of her urine, the mechanism of dilute and copious urine production in this type of case was fully explained by Platt in his Lumleian Lectures (1952). So profound are the processes responsible for diuresis here that any degree of moderate glomerular shutdown, if it had occurred, would have been entirely masked by them.

Denervation in the fourth case was incomplete, inasmuch as presacral neurectomy had not been performed and the effectiveness of the phenol injection of the vessel had not had time to develop. Emphasis is thus once again provided indirectly on the value of uterine denervation in this method of therapeusis, and Mr. Theobald has unwittingly gone far to prove that interruption of nervous stimuli originating in the uterus prevents the toxaemic process. The utero-renal reflex offers an explanation of the pathway of these stimuli, and if interpolated suffices to explain the renal changes of toxaemia. Although the tension of the multiparous uterus is not as high as the primiparous, the renal soil has been so prepared in the essential hypertensive as to react to weaker stimulation (Sophian[4]). It is these stimuli which internal iliac denervation and presacral sympathectomy interrupt, and therefore toxaemia fails to develop.

Mr. Theobald attempts to discount the thesis of a nervously integrated renal shutdown arising from the uterus because of its tension by certain invalid arguments. For instance, he has failed to appreciate Poiseuille's law by confusing tension of the uterine wall with a raised intrauterine pressure in his experiment of filling the distensible postpartum uterus in the hope of highly accentuating its tension. There is no proof that he had succeeded in effecting the latter, and it is therefore wrong for him to expect evidence of a utero-renal reflex acutely evoked thereby. In certain experiments of which I have knowledge, the intact (not the denervated) artery of supply to one horn of the rabbit's uterus was electrically stimulated and resulted in renal shutdown. In his experiments both the site of application of the stimulus and the fact that the internal iliac was sympathectomized serve to destroy any analogy.

It is apparent that readers of the article must interpret the data quite differently from Mr. Theobald.—I am, etc.,

Salisbury, S. Rhodesia. JOHN SOPHIAN.

REFERENCES

1 *Transactions of the 12th British Congress of Obstetrics and Gynaecology*, 1949, p. 140.
2 Ibid., 1949, p. 143.
3 *Textbook of Anatomy*, 1943, 8th ed., p. 1107. London.
4 *Symposium on the Circulation*, 1952. Ciba Foundation.

Incidence of Scabies

SIR,—I wonder whether any of your readers have noticed an increase in the number of cases of scabies occurring in their practices recently? I notice that in the out-patient clinics attended by the dermatological unit in this area we had only four cases of scabies in 1951, and six cases in 1952; whereas in the first 10 weeks of this year we have had 19 cases.

I believe I am correct in saying that a marked increase in scabies arose just before the 1914–18 war, and some 18 months before the 1939–45 war, the significance of this being that in both cases the increase was pre-war. I am not trying to spread alarm and despondency, but would be interested to hear if there is now an increase in scabies after the marked drop we had at the end of the last war.—I am, etc.,

Bradford. ALLAN BIGHAM.

Cricket

SIR,—You very kindly published a letter of mine in the *Journal* of June 7, 1952 (p. 1251), in which information was given that a cricket match had been arranged between the B.M.A. and the Law Society at Hurlingham, London, on Sunday, July 5, 1953, at 11.30 a.m. The response to this letter was encouraging. The replies were often informative, not infrequently amusing, and without exception couched in humble terms in regard to the prowess of the writers.

The approach of another cricket season prompts me to put out this reminder in the hope that other members of the Association who are interested in cricket may be encouraged to get in touch with me as soon as possible, so that the best possible available side is obtained. At the moment the most urgent need is a wicket-keeper and a slow left-hand bowler.—I am, etc.,

The Little House, Broadwater Down, Tunbridge Wells. R. PROSPER LISTON.

Life of Hugh Owen Thomas

SIR,—I am writing a new *Life of Hugh Owen Thomas*, together with a revised edition of his collected works. Any assistance in this task would be welcomed; in particular I am anxious to have access to previously unpublished material. Letters or documents relating to any aspect of Thomas's private or professional life, or to the history of the family, will be carefully handled and returned to the owners as soon as possible.—I am, etc.,

10, Harley Street, London, W.1. DAVID LE VAY.

POINTS FROM LETTERS

Research in General Practice

Dr. B. BARNETT (Birmingham) writes: Professor Robert Platt's article (*Journal*, March 14, p. 577) has to be welcomed, since it highlights some of the problems of general practice as it operates at present and the richly rewarding work which would incidentally appear from a reorganization of such work. Facility for research can arise only when facility for adequate work has been provided. Records, ancillary workers, fuller examination, adequate facilities, liaison with other doctors, some form of group practice—these are the prime requisites, and until they are met we can expect little. We yet have to be thankful to Professor Platt for showing us a beacon ahead.

Recurrent Boils

Dr. E. MCKERROW (Workington, Cumberland) writes: With reference to the Refresher Course article on boils (*Journal*, March 28, p. 721), within the past few years I have had two cases of recurrent boils in elderly couples. In both cases the husband was the first patient, and in both cases the focus of infection was eventually proved to be the umbilicus of the wife. Soon after this was discovered and cleared up there was an end to boils in both cases.

Patients as Individuals

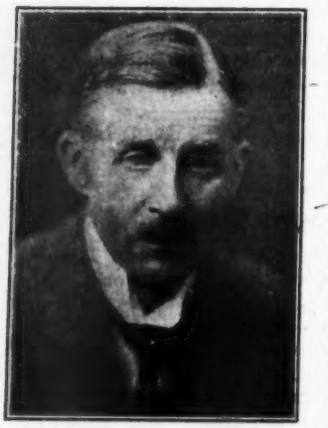
Dr. J. M. MACLENNAN (Vancouver) writes: Dr. R. R. Bomford's "discursive and eclectic review of some changing concepts in medicine" (*Journal*, March 21, p. 633) is perhaps deliberately provocative. Certainly the medicine he was taught nearly 25 years ago is strangely different from that which I was taught at the very same period. Our teachers insisted on the study of the patients as individuals. That there was a personality factor in peptic ulceration, rheumatoid arthritis, asthma, etc., was made very clear to us. We were urged to study people's faces as well as the domestic and industrial environment of our patients. Did Dr. Bomford not hear those things 25 years ago? His Bradshaw Lecture sends one back with renewed appreciation to Professor C. F. W. Illingworth's Refresher Course article on peptic ulcer (*Journal*, July 26, 1952, p. 206), so brief, so clear, so firmly based, and so closely related to the patients and their experiences.

Obituary

ALEXANDER MILES, M.D., LL.D., F.R.C.S.Ed.

Mr. Alexander Miles, who died at his home in Edinburgh on April 9 at the age of 87, was one of the leading surgeons of his day. He will be remembered also for his outstanding work on behalf of the Edinburgh medical school.

Alexander Miles was born at Leith on May 21, 1865, and was educated at George Watson's College and at the University of Edinburgh, where he graduated M.B., C.M. in 1888. He was elected F.R.C.S.Ed. in 1890 and proceeded to the M.D. in the following year, winning the gold medal and the Symes Surgical Fellowship for his thesis. After holding the appointments of clinical assistant in the observation wards and resident surgeon at Edinburgh Royal Infirmary, he became lecturer in anatomy in the University, assistant surgeon to the Royal Infirmary, and surgeon to Leith Hospital. He was also appointed lecturer in surgery in the school of medicine of the Edinburgh Royal Colleges. In 1909 he was promoted to full surgeon at the Infirmary, retiring in 1924. Mr. Miles succeeded the late Sir James Hodsdon as the representative of the Royal College of Surgeons of Edinburgh on the General Medical Council in 1928, and he continued to serve in that capacity until 1943. He was a member of the executive committee of the Council for 10 years; of the penal cases committee and the finance committee for 12 years; the public health committee in 1928–9; the examination committee from 1929 to 1939; and of the education committee from 1940 to 1943. In addition he was appointed a member of the Dental Education and Examination Committee, a committee set up for the purpose of the revision of the dental curriculum in 1931. On Miles's retirement from the G.M.C. the President paid tribute to his sober judgment and wise counsel, especially as a member of the penal cases committee. When the British Medical Association held its Annual Meeting at Aberdeen in 1914 Mr. Miles acted as a vice-president of the Section of Surgery, and from 1926 to 1930 he was a member of the Arrangements Committee. For a time Mr. Miles was joint editor of the *Edinburgh Medical Journal*, and he was a past president of the Royal Medical Society of Edinburgh.



[*Swan Watson, Edinburgh*

We are indebted to Mr. W. J. STUART for the following appreciation: Despite the fact that Mr. Miles had reached his 88th year he had, until the comparatively recent onset of ill-health, so maintained his active interest in the Edinburgh medical school and all that concerned it that his death means much more than the passing of a half-forgotten figure. He gave the qualifying lecture courses in surgery and in operative surgery in the extramural school of medicine of the Royal Colleges of Edinburgh, and his classes were always large. According to custom he discontinued the classes on his appointment as surgeon to the Infirmary, a post which he held for the routine period of 15 years till 1924, and during that time and thereafter his work for the university became increasingly important. He was a member of the University Court, and was also one of the Curators of Patronage, in whose hands lie the appointments to certain university chairs in Edinburgh. In 1925 his university deservedly honoured him by conferring upon him the degree of LL.D. His connexion with the Royal College of Surgeons of Edinburgh was also close. He was a most efficient secretary and treasurer for seven years, president for the usual two years, and its representative on the General Medical Council for 15 years. In later life one of his greatest interests lay in the Astley-Ainslie Hospital for occupational therapy, of whose board he was the first chairman, and his constant interest was a significant factor in its success.

The most important of his numerous contributions to medical literature was undoubtedly the *Manual of Surgery*, written jointly with Alexis Thomson, which was first published in 1904. It became an immediate favourite among students and young graduates, and its continued popularity was indicated by the publication in 1939 of the ninth edition, for which, owing to the death of Alexis Thomson, Miles had obtained the collaboration of the late Sir David Wilkie. For the last edition of his textbook on *Operative Surgery*, published in 1950, he had Sir James Learmonth as joint editor: it must be exceptional that any man at the age of 84 should be capable of such work and, moreover, of writing the chapter on amputations contained in that volume.

Miles was one of the prominent surgeons of his time in the Edinburgh school, and it is difficult to realize that it is almost 30 years since the close of his active hospital life. His increased leisure in later years enabled more use to be made of his great administrative and organizing gifts by the university and other institutions, to which he freely gave his services. He is survived by his wife, formerly Miss Helen J. Greig, and a daughter.

We are indebted to Dr. HARLEY WILLIAMS for the following appreciation: Having to choose my first surgical clinic, I consulted an older man, who said, "You will learn a lot from Sandy Miles." He was indeed considered the best all-round surgeon in the Royal Infirmary: from him I learnt all I was capable of learning. He was slight, fresh, and sandy, and he operated without gloves, with his sleeves loosely rolled up. His hands were small but very capable, and in teaching he was neither reticent nor talkative. To watch him handle a patient was in itself a perfect process of learning. Students used to smile at the frequent use he made of his self-invented instrument, the Miles "dissector," which was a very ordinary tool such as we felt anyone might have devised. That was typical of Miles's approach to an operation. Technique for him meant the simplest, most fundamental way of doing a thing. He had a tepid sense of humour, but only once do I remember his throwing an instrument upon the floor—not the beloved dissector, but a pair of forceps that would not grip. His surgical results were the justification of his craftsmanship. Alexander Miles was known at Edinburgh as the conscientious partner in that team of extraordinary opposites—Thomson and Miles. Each was everything the other was not. Alexis Thomson, brilliant, eccentric, reckless: Miles, cautious, careful, conscientious. They hung together over many years with enormous mutual respect. Yet it always seemed amazing that their jointly written textbook could have so successfully emerged from this incongruous association. At the final examinations many students would encounter that strange partnership for the last time. Alexis Thomson was impetuous, impatient, and then bored. The ever-kindly Miles ran the show, calmed the alarmed examinee, and supplied the proper efficiency and fairness.

Under his conventional exterior there must have been a secret poet, for he called his house in Perthshire by a Gaelic name meaning "hill of the fairies" or something of that kind. His only son, Hamish Miles, who died many years

ago, was becoming well known in literature and wrote a life of Arthur Machen. Miles the surgeon lived on for more than 20 years after his retirement, still nimble, young-looking, kindly, a monument to the influence of an equable temperament and the virtues of moderation.

Sir EDWARD WORTHINGTON, K.C.V.O.
C.B., C.M.G., C.I.E., M.R.C.S.

Sir Edward Worthington, who entered the R.A.M.C. in 1900 and was at one time physician to the late Duke of Connaught, died on April 5 at the age of 76.

Edward Scott Worthington was born on October 15, 1876, and was educated privately and at Trinity University, Toronto. Soon after qualifying M.R.C.S., L.R.C.P. in 1899 he volunteered for service as a civil surgeon in the war in South Africa, and in November, 1900, he entered the R.A.M.C. as a lieutenant, having been recommended for a commission by the commander-in-chief. For his services in South Africa he was awarded the Queen's medal, with four clasps, and the King's medal, with two clasps. After a brief period in the United Kingdom in 1902–3 he served in India for five years before returning to England in 1908. Two years later he was present, as medical officer on the staff of the Duke of Connaught, at the opening of the first Parliament of the Union of South Africa, and he later went to Canada when the Duke was appointed Governor-General of the Dominion. When war broke out in 1914 Worthington was recalled to England, and he was with the British Expeditionary Force in France until October, 1916, when he returned to England. Towards the end of the war he was deputy assistant director-general of medical services at the War Office for a short time, and he also became an Honorary Physician to the King. He retired in 1926. Worthington was the recipient of many Crown honours. He was appointed M.V.O. in 1911 and created a knight in 1913. For his war services he was awarded the C.M.G. in 1915 and the C.B. in 1918, in which year he was also promoted K.C.V.O. His appointment as C.I.E. was the reward for his services as medical officer on the staff of the Duke of Connaught in India when the Princes' Council was opened in 1920. Other awards he received were the Belgian Croix de Guerre and the American Distinguished Service Medal, and he was appointed an Officer of the Order of Leopold of Belgium and of the Sacred Elephant of Siam. He was also appointed a Knight of Grace of the Venerable Order of St. John of Jerusalem in 1913. Worthington married Miss Winifred J. Wallace in 1914 and had one son and one daughter.

R. PATERSON SMITH, M.D., D.P.H.

Dr. R. Paterson Smith, who was professor of pathology and bacteriology at Dalhousie University, Halifax, Nova Scotia, for more than 20 years, died in Newcastle-upon-Tyne on April 7. He was 57 years of age.

Ralph Paterson Smith was a native of Greenock and was educated at Greenock Academy and Glasgow University, where he graduated M.B., Ch.B. with honours in 1918. After a period of service in the R.A.M.C., during which he was in Egypt for a time, he returned to Glasgow as assistant to the professor of pathology. In 1922 he took the D.P.H., and in the following year he went to Newcastle—his wife's home town—as lecturer in pathology at Durham University and assistant pathologist to the Royal Infirmary. It was in 1927 that he was appointed to the professorship of pathology at Dalhousie University, but before he left for Canada he had submitted a thesis for the M.D. degree of Glasgow University on the subject of enteric fever, and for this he was awarded the Bellahouston gold medal.

From 1927 to 1950 Professor Paterson Smith, who was a born teacher, played a prominent part in the medical affairs of the Maritime Provinces of Canada, and his advice was widely sought on medico-legal and educational matters. He examined in pathology for the Dominion Medical Council of Canada and for the Canadian College of Physicians and Surgeons. A Founder Fellow of the College of American Pathologists, he was also a member of several other learned societies in North America. His writings covered a wide range of subjects, including bacteriology, parasitology, and toxicology, but his main interest was in neoplastic diseases, and in this branch of study he left his mark on medical teaching. An important paper on "Lobular Hyperplasia of the Breast" was published in the *Canadian Medical Association Journal* in 1940.

Genial and courteous in manner, Paterson Smith was a most energetic worker, and when three years ago he returned to this country as consultant pathologist to the Newcastle General Hospital he put all his heart into the organization of his department. He leaves a widow and five sons, of whom three have settled abroad and one is a medical student at the University of Durham.

After a prolonged illness contracted on service and borne with great cheerfulness and fortitude, Colonel R. W. VINT died on March 2 at the age of 65. Robert Washington Vint was born at Carrickfergus, Co. Antrim, on July 4, 1887, a twin son of the late Mr. John Vint, and was educated at the Royal Belfast Academical Institution, matriculating at the former Royal University of Ireland, and later studying medicine at the old Queen's College, Belfast, where he was a keen player of Rugby football. After graduating M.B., B.Ch. in 1910 he served as house-surgeon at the Maternity Hospital, Belfast, and later as house-surgeon and house-physician at the Royal Victoria Hospital. He entered the R.A.M.C. by competitive examination in 1912, and was in India when war broke out in 1914. He then served with a field ambulance in Mesopotamia and Persia, gaining considerable surgical experience. After the war he served in the United Kingdom, Malta, and India, chiefly as a surgical specialist, and wherever he went he was universally popular. During the last war he was in command of a large hospital in India, and later became A.D.M.S., Waziristan District, North-west Frontier Province, and an Honorary Surgeon to the Viceroy of India. On reaching the age of retirement he was re-employed to command a large tuberculosis hospital in the Indian hills, and he finally retired in 1947. Colonel Vint is survived by his wife and one son. His death will be deeply felt by a multitude of friends in many parts of the world.

Dr. WILLIAM WHITE, who died at his home at Cappoquin, Co. Waterford, on March 7 in his 80th year, was the son of the late Dr. Thomas Kyran White, of Kilsheelan, Co. Tipperary. William White was educated at Blackrock College and the old Queen's College, Cork, graduating M.B., B.Ch. from the former Royal University of Ireland in 1898. After graduation he held the post of house-surgeon at the County and City Infirmary, Waterford, and afterwards acted as assistant resident medical superintendent at the mental hospital there. During the war in South Africa he served as civil surgeon, and was attached to the 13th Lancers and the 9th Hussars. After the war he entered general practice and worked successively in Liverpool, in Mullinavat, Co. Kilkenny, and in Whitechurch, Co. Waterford, until, in 1914, he was appointed medical officer of health for the Cappoquin

district, where he practised until his death. Dr. White was an all-round athlete. He was a keen horseman from his early days and rode with the Tipperary hounds. Besides being an amateur boxer of some skill, he played Rubgy at Blackrock College and at Queen's College, Cork, and gained an inter-provincial Rugby cap for Munster in 1892 and again in 1893. He also represented County Tipperary in the Gaelic Field and was captain of the Shandon Rowing Club, Cork, for some years. The achievements of his youth he recollected pleasantly, but it will be as a general practitioner of the highest order that he will be remembered by his colleagues and his patients. Dr. White kept well abreast of the times, and excelled as a diagnostician, using a happy combination of old and new methods. His punctuality was a byword in the neighbourhood, his attention to his patients never failed, while his good humour and quiet manner endeared him to all. Dr. White is survived by his son and four daughters, Mrs. White having died in 1944. His son, Thomas Kyran White, was formerly a colonel in the Indian Medical Service, and one of his daughters, Dr. Winifred A. White, is in practice at Cappoquin.—M. O'F.

Dr. E. C. BRADFORD, who was in practice at Horsham, in Sussex, for many years, died in hospital at Durban, South Africa, on March 24, aged 63. Ernest Cordley Bradford was born on August 13, 1889, the son of the late Dr. Cordley Bradford, a well-known general practitioner of Acock's Green, Birmingham, and was educated at Rugby, Pembroke College, Cambridge, and at St. Bartholomew's Hospital, qualifying M.R.C.S., L.R.C.P. in 1914, and taking the degrees of M.B., B.Chir. in the following year. He was a house-surgeon at the Birmingham General Hospital before entering the R.A.M.C. to serve in the war of 1914–18. After the war he settled in general practice at Horsham, retiring because of illness in 1943. An enthusiastic member of the British Medical Association, he was honorary secretary of the Horsham Division from 1925 to 1933, and chairman of the West Sussex Division from 1934 to 1937. After his retirement Dr. Bradford fought against ill-health with such great courage that in 1951 he was able to take a post as ship surgeon and make several trips round Africa. His new appointment brought with it a return of his old zest for life and enjoyment in work, but unfortunately his health again deteriorated. Although he was really unfit for his last trip, he made light of his symptoms and rejoined his ship. But he had to be put ashore at Durban, and there he died, in harness, as did his father before him. Dr. Bradford was bred in the old tradition of medical practice, and had ingrained in him all the attributes which go to make the ideal general practitioner. First and foremost a family man, he had a wide range of interests, including all kinds of sport. He served the Horsham Hospital with a strong sense of duty, and many local societies and institutions also received his support. A real friend to the families whom he attended, he was quite unsparing of himself and always ready to do acts of kindness which many people would consider unnecessary for a busy man to undertake. So, as with many of the best general practitioners, the strain began to tell, and his last few years in general practice were an increasing struggle against failing health. He leaves a widow and three sons, two of whom are following their father's profession.—J. W. D.

We record with regret the death on March 28 of Mr. KENNETH TURNBULL at the early age of 33. He and his wife were killed in a motoring accident in Southern Rhodesia when their car ran into the back of a stationary lorry. Kenneth Turnbull was born on January 20, 1920, and had a distinguished career at the medical school of the University of Durham, where he graduated M.B., B.S., with second-class honours, in 1942. After holding the appointment of house-surgeon at the Royal Victoria Infirmary, Newcastle-upon-Tyne, he entered the Royal Navy for service in the last war, and was seconded to the Fleet Air Arm in 1943. On his release from the Royal Navy in 1946 he returned to the Royal Victoria Infirmary and was subsequently appointed surgical registrar. He took the Fellowship of the Royal College of Surgeons of England in 1948. Two years later he went out to Salisbury, in Southern Rhodesia, where he soon built up a large and successful surgical practice. Last year he and his wife and small son returned to this country on holiday for a few months, and they had not been long back in Southern Rhodesia when the tragedy happened.

We are indebted to Professor J. HAMILTON BARCLAY for the following appreciation: Kenneth Turnbull was an outstanding man in every way, and the cutting short of such a promising career is hard to understand. While a student at Newcastle-upon-Tyne he was a noted athlete, and he played for the University of Durham at both Association and Rugby football, and was president of the Durham University Athletic Union, winning the 100 yards two years running. In addition he was also "capped" at Rugby for Durham County. On the surgical side he showed ability much above the average and gave promise of becoming a first-class surgeon. He was a most charming and unassuming man, and was liked by everyone with whom he came in contact. His wife, formerly Miss Jean C. Gossage, whom he met during the war when she was an officer in the W.R.N.S., had also a most delightful and pleasing personality. They leave a little son, aged 3. Our sincere sympathy goes out to the parents of Mr. and Mrs. Turnbull and to their son.

Medical Notes in Parliament

Hospital Medical Staff

Mr. A. BLENKINSOP asked the Minister of Health on April 16 what total reduction in the medical staffs of teaching and non-teaching hospitals he anticipated during the current financial year.

Mr. IAIN MACLEOD replied that he could not predict the results of the special review of medical staff which he had asked hospital authorities to make.

Mr. BLENKINSOP asked how many of the registrars, of which the Minister must know the number, were likely to go out of practice during the next 12 months.

Mr. MACLEOD said there was no particular pressure being put on the department in that matter, although it was a difficult one.

Dr. BARNET STROSS said that many hospitals were finding difficulty in obtaining junior registrars. Had the Minister considered what he could do to help them, so that men in senior appointments had the necessary help to carry on their work?

Mr. MACLEOD replied that the figures for junior registrars had been for some time closely in accord with the planned schedule laid down by the Socialist Government. There were difficulties there, but the total number of specialist posts becoming available was unhappily not as high as was hoped when it was laid down.

Mr. BLENKINSOP asked him to explain how it was that there had been a big drop in the provision made in the estimates for medical staff of the teaching and non-teaching hospitals.

Mr. MACLEOD said that Mr. Blenkinsop was fallaciously comparing this year's estimates with last year's estimates, instead of last year's outlay. There had been, in fact, no change.

Mr. BLENKINSOP also asked the Minister if he would give the number of senior registrars whose appointments were being terminated and for whom there were not likely to be vacancies in hospitals, and what action he proposed to take.

Mr. MACLEOD replied that this information was not available, as the number of hospital vacancies could not be predicted with any accuracy. He was, however, reviewing the position in consultation with representatives of the profession.

Dangerous Drugs

Dr. BARNET STROSS asked the Minister of Health on April 14 if he would list the drugs that were known to cause malignant neutropenia, agranulocytosis, and acute leukaemia; what statistics he had showing the incidence of these conditions during the past two years, as compared with the year 1930; and whether he would withdraw from the official pharmacopoeia any of these drugs known to carry this danger.

Miss PAT HORNSBY-SMITH, the Parliamentary Secretary, replied that any list would be misleading. Many valuable drugs had on occasion been suspected of being the toxic factor in these diseases, but any particular drug had relatively seldom been incriminated; moreover, many patients had taken such drugs without any disorder of the blood resulting. The figures asked for were not available. The contents of the *British Pharmacopoeia* were a matter for the Pharmacopoeia Commission.

Central Purchasing

Mr. A. BLENKINSOP asked the Minister of Health on April 16 why he was proposing to reduce the amount of central purchasing of general medical and surgical stores and appliances and drugs and vaccines in the current financial year, in view of the economies that had been effected by central purchasing in the past.

Mr. IAIN MACLEOD replied that the reduction in estimated expenditure on these supplies in 1953–4 was due mainly to revision of the estimated amount of direct purchases for other Government departments. The amount of central purchasing and contracting for the National Health Service had not been reduced.

Tuberculosis Treatment Abroad

Mrs. JEAN MANN asked the Secretary of State for Scotland how many Scottish tuberculous patients were receiving treatment outside Scotland, where the sanatoria concerned were situated, what was the cost per patient in these sanatoria, and what was the corresponding cost in Scottish sanatoria.

Mr. J. STUART informed her that the present number receiving such treatment under National Health Service arrangements was 195, in three sanatoria in Switzerland. The average daily cost of treatment was about 30s., or 34s. 4d. allowing for transport and incidentals such as dental treatment. The average daily cost in Scottish sanatoria was about 23s. 6d.

Cremation Certificates

Mr. J. REEVES asked the Home Secretary on April 16 whether his attention had been drawn to the high fees charged by medical practitioners for certificates required under the Cremation Acts, and whether he would expedite the negotiations with the appropriate medical professional bodies so that a maximum fee might be fixed within the reach of the ordinary wage-earner.

Sir HUGH LUCAS-TOOTH, the Under-Secretary, said that the Home Secretary hoped to make a statement in the near future.

Industrial Diseases Inquiry

Mr. OSBERT PEAKE, in reply to a question on April 16, stated that the committee to consider the cover for diseases under the Industrial Injuries Act had been appointed, and Mr. F. W. Beney, Q.C., had accepted the chairmanship. The terms of reference of the committee were: "To review the present provisions of the Industrial Injuries Act under which benefit is paid for diseases and for personal injuries not caused by accident, and to make recommendations." The membership was: Mr. J. W. Berry, Sir Ernest Rock Carling, Mr. C. R. Dale, Sir Wilfrid Garrett, Mr. R. Kean, Sir William Lawther, Dr. L. G. Norman, Mr. A. Roberts, Dr. Alice Mary Stewart, Mrs. Gertrude Williams. One other member was to be appointed after consultation with the nationalized industries.

Medico-Legal

NEGLIGENCE

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

There has in recent years been a large increase in the number of actions which have come before the courts in which allegations of professional negligence have been made against doctors. Sometimes it is the doctors themselves, sometimes the hospital authorities which employ them, that the actions are brought against. This situation is causing concern in the profession, and there is a widespread feeling that the results of such actions show that the courts are not properly distinguishing between the sort of mistakes which are inevitable in the practice of medicine and have to be accepted as the price to be paid for the advance of medical science, and the sort of mistakes which properly deserve the stigma of negligence and for which compensation should properly be awarded.

It has first to be said that in all the recent cases there has been no change whatsoever in the law. In common with all those who hold themselves out as carrying on any skilled activity, the doctor is under a duty in law to use "due care, diligence, and skill" towards his patient. Failure to do so which results in damage to the patient renders him liable to pay damages for negligence. The degree of care, diligence, and skill which he must exercise to fulfil his duty is the degree which would be expected of him by the general consensus of opinion in the profession, his experience and qualifications being taken into consideration, together with what he has set out to do, and the conditions in which he set out to do it. A less exacting standard will be required of the newly qualified surgeon carrying out an emergency operation in a man's home which could not wait until he could be got to hospital than would be required of a specialist carrying out the same operation with all the resources of a hospital at his disposal. This is not only sound law, but, like most sound law, good common sense.

The Importance of Expert Witnesses

Moreover, since it is only by means of the expert evidence of medical witnesses that the law can be applied to each particular set of facts which is brought before the courts, it is the doctors themselves who in the ultimate analysis set the standard of care which dictates whether a mistake is negligent or simply one of those which must be accepted.

No action involving allegations of negligence against a doctor can be won unless the plaintiff can support his case by calling as an expert witness a doctor who will swear that what was done fell short of the degree of care, diligence, and skill which would have been expected in the circumstances by the general consensus of opinion in the profession. If, after hearing that expert witness cross-examined, and after hearing the experts called by the defence to prove the contrary examined and cross-examined, the Court prefers the evidence of the expert witness called for the plaintiff, there will be a finding of negligence against the doctor. But a finding of negligence against a doctor can be reached by no other road.

Accordingly, where the Court in finding negligence against a doctor reaches a wrong conclusion, the most that can be said is that it has preferred the evidence of the wrong expert, and has been misled by a doctor who took the wrong view of the general consensus of professional opinion on the facts of the particular case. There is no other basis upon which a wrong conclusion can be reached.

Effect of Free Legal Aid

If statistics were available they should therefore show that, while there has been a great increase in the number of actions brought involving allegations of negligence against doctors, there has been no significant increase in the propor-

tion of such actions which have been successful. The reason for the increase in the number of actions brought does not lie in any change in the law; nor is it to be found in the institution of the National Health Service, which has in no way altered either the legal concept of the duty of the doctor towards his patients or the test of "general consensus of opinion in the profession" by which the legal concept is applied. The increase in actions has largely occurred since 1949, and is undoubtedly the result of the Legal Aid and Advice Act passed in that year.

Since the 1949 Act it has become financially practicable for any plaintiff, however poor, who can satisfy a committee set up under the Act that on his own version of what happened he has a prima facie case of negligence against a doctor or hospital, to litigate his case in the High Court. Before the 1949 Act, unless he had substantial means of his own or from some other source to support him, he had in practice no hope of litigating such an action, owing to the very heavy expense necessarily involved. Now, provided he has a prima facie case, the State will make up the deficit which previously would have prevented him from bringing the action, even though he may well lose it in the end.

Like many others who were largely protected before 1949 by the cost of litigation, doctors are now exposed in practice as they have always been in theory to the actions of any patients who consider that they have been injured by a breach of the doctor's duty towards them. The standard of duty is set by the medical profession itself, so that it lies in the doctor's own hands to see that, although occasionally a case will have the wrong result, substantially no injustice either to patient or to doctor will be done.

Universities and Colleges

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College, held on March 12, with Sir Cecil Wakeley, President, in the chair, a report of the death of Professor Johan Holst, of Oslo, an Honorary Fellow of the College, was received with deep regret.

The Hallett Prize was presented to A. T. Matheson (Capetown) and the Handcock Prize to A. H. Tooley (King's College Hospital). The Council received reports of the renewal of the Mackenzie Mackinnon Research Fellowship of Dr. I. K. R. McMillan (St. Thomas's) and the Streatfeild Research Scholarship of Mr. A. T. Andreasen.

A Diploma of Membership was awarded to D. B. Fox (University College).

At a meeting of the Council of the College held on April 9, with Sir Cecil Wakeley, President, in the chair, Professor Reynaldo dos Santos, of Lisbon, was admitted to the Honorary Fellowship.

The following were elected Fellows of the College without examination as being medical practitioners of at least 20 years' standing: Mr. W. E. Tucker (Bermuda), Professor F. Davies (Sheffield), Mr. J. Dobson (Wigan), Mr. R. Scot Skirving (Sydney), Mr. A. E. Coates (Melbourne).

The Jacksonian Prize for 1952 was awarded to Mr. John Borrie (New Zealand), and a certificate of honourable mention was awarded to Mr. Rodney Smith (St. George's) for their essays on the surgical treatment of carcinoma of the stomach. The Council selected "Melanomas and Melanosis" as the subject for the Jacksonian Prize for 1954.

The Council received a gift of the *Conquest of Ceylon*, in three volumes, by P. de Queyroz, from the Faculty of Medicine, University of Ceylon

Diplomas in Physical Medicine, in Ophthalmology, in Tropical Medicine and Hygiene, in Laryngology and Otology, in Industrial Health, and in Medical Radiotherapy were granted, jointly with the Royal College of Physicians of London, to the following successful candidates:

DIPLOMA IN PHYSICAL MEDICINE.—L. S. Bain, E. E. Bullock, A. B. Coyer, J. A. M. Joyce, S. Mattingly, A. P. H. Randle, Dorothy J. Roth, R. A. Shaddick, G. O. Storey.

DIPLOMA IN OPHTHALMOLOGY.—Judith MacA. Brown, R. U. Chowdhary, K. J. Dastur, J. M. Heaton, S. Itchhaporia, B. R. Jones, Mary A. C. Jones, A. T. Karsgaard, M. K. Mehra, J. Moss, M. Nawaz, C. I. Phillips, A. Samad, J. Singh, J. R. van der Merwe, Billie I. Williams, T. Wilson.

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—I. Ahmad, Anwar-ul-Islam, T. Awuku-Asabre, A. R. O. Bakare, S. A. Biggart, E. B. Bright, G. H. Burgess, Carmel Cachia, J. E. Cranswick, R. A. Davis, S. R. A. Dodu, P. F. Doherty, I. M. Grant, C. H. Gurd, S. M. M. Haque, H. G. Hendow, C. S. Heymann, Jasmine R. Jacob, V. V. Kalbian, W. N. Laing, A. R. T. Lundie, A D. A. Maconochie, D. E. Marmion, S. Nadesan, M. C. Peterside, Irene Rajaratnam, D. Ramadwar, S. Paul, A. W. Senft, P. Sirivorasarn, H. G. Skinner, G. J. Stott, Gladys M. Vanniasingham, A. V. A. Vethanayagam, S. Vyas, M. C. Williams, W. Williams, R. Woodward.

DIPLOMA IN LARYNGOLOGY AND OTOLOGY.—P. J. Damato.

DIPLOMA IN INDUSTRIAL HEALTH.—P. H. Nash.

DIPLOMA IN MEDICAL RADIOTHERAPY.—R. Finney.

Hospitals were recognized under paragraph 23 of the F.R.C.S. regulations as follows: Albert Dock Hospital, London, orthopaedic registrar, for six months; house-surgeon, for six months; *from January, 1954*, casualty and receiving-room officer. Paddington Hospital, surgical registrar; two house-surgeons, for six months. Jersey General Hospital, St. Helier, resident surgical officer, for six months (until March, 1956). Pontypool Hospital, house-surgeon, for six months. Griffithstown County Hospital, senior house officer (general surgery), for six months. Kingston Hospital, *decennial revision*, two senior house officers (orthopaedic and casualty); two senior house officers (general surgery); two house officers (general surgery), all for six months. Ipswich Borough General Hospital, *additional recognition*, junior orthopaedic registrar, for six months. Pembroke County War Memorial Hospital, Haverfordwest, *confirmation of temporary recognition*, resident surgical officer, for one year; house-surgeon, for six months. Bridge of Earn Hospital, *additional recognition*, registrar (general surgery), for six months. Birmingham Accident Hospital, *revision from January, 1954*, four resident surgical officers; six house-surgeons. Royal Hampshire County Hospital, Winchester, *additional recognition*, two house-surgeons (general surgery and ear, nose, and throat); house-surgeon (general surgery and ophthalmology), all for six months, *from January, 1954*, casualty officer, to be recognized for casualty work and not, as hitherto, for general surgery. Royal Victoria Hospital, Bournemouth, *from January, 1954*, casualty officer; orthopaedic house-surgeon. Bridgend General Hospital, *from January, 1954*, casualty house-surgeon. Chase Farm Hospital, Enfield, *from January, 1954*, casualty officer, to be recognized for casualty work and not, as hitherto, for general surgery. Dulwich Hospital; *redesignation*, "surgical registrar" to be replaced by "resident surgical officer"; *from January, 1954*, casualty officer. St. Giles's Hospital, London, *from January, 1954*, casualty officer. St. Andrew's Hospital, Bow, *from January 1954*, casualty officer. Woolwich Memorial Hospital, *redesignation*, "senior resident surgical officer" now becomes "registrar general surgery"; *from January, 1954*, casualty officer (senior house officer). Mansfield and District Hospital, *alteration to existing recognition*, omit senior house-surgeon; *from January, 1954*, two senior house officers to casualty and orthopaedic department. Royal Gwent Hospital, Newport, *from January, 1954*, two senior house officers (casualty). Northampton General Hospital, *from January, 1954*, casualty officer; *additional recognition*, fourth house-surgeon, for six months; *redesignation*, "resident surgical officer" now becomes "senior surgical registrar." Perth Royal Infirmary, *from January, 1954*, house-surgeon (casualty). Queen Mary's Hospital, Sidcup, *from January, 1954*, casualty officer. St. Nicholas Hospital, Plumstead, *from January, 1954*, first and second casualty officers. Merthyr General Hospital, resident surgical officer, house-surgeon, both for six months. St. Albans City Hospital, *confirmation of temporary recognition*, two surgical registrars, both for 12 months; two house-surgeons, both for six months. *From January, 1954*, casualty officer. Bolton Royal Infirmary, *paragraph 23c*, ear, nose, and throat, registrar. Royal Hospital, Richmond, *decennial revision*, house-surgeon, for six months. Royal Salop Infirmary, Shrewsbury, *additional recognition*, orthopaedic house-surgeon, for six months. *From January, 1954*, casualty house-surgeon. Portsmouth and Southern Counties Eye and Ear Hospital, *paragraph 23c*, ear, nose, and throat registrar; senior house officer (otolaryngology). St. Richard's Hospital, Chichester, *from January, 1954*, casualty officer. Epsom District Hospital, *revision, increased* period of recognition of resident surgical officer (surgical registrar) from six to twelve months. *From January, 1954*, casualty officer. Queen Mary's Hospital for the East End, *decennial revision*, resident surgical officer, deputy resident surgical officer, both for twelve months; two house-surgeons, each for six months. Poplar Hospital, *decennial revision*, two house-surgeons, for six months. *From January, 1954*, casualty house-surgeon. Clare Hall Hospital, Barnet, *redesignation*, registrar has now become

"senior registrar." Blackburn Royal Infirmary, *revision*, surgical registrar, for twelve months; senior house officer (general), three house officers, all for six months. *From January, 1954*, two senior house officers (orthopaedics and casualty). Queen's Park Hospital, Blackburn, *revision*, surgical registrar for twelve months; house officer (general), for six months. Dryburn Hospital, Durham, *additional recognition*, surgical registrar, for six months. City General Hospital, Gloucester, *revision*, orthopaedic registrar; orthopaedic house-surgeon, both for six months. Ballochmyle Hospital, Mauchline, *additional recognition*, two junior house officers, for six months. Birkenhead General Hospital, *from January, 1954*, two casualty officers. Reduction of period of recognition of posts already recognized from twelve to six months: two surgical registrars; orthopaedic registrar; senior house-surgeon. Chester Royal Infirmary, *from January, 1954*, casualty officer. *Redesignation*, orthopaedic registrar has been replaced by assistant orthopaedic surgeon (S.H.M.O.). Bootle Hospital, *from January, 1954*, casualty officer. Ashford County Hospital, *redesignation*, three surgical registrars become one senior registrar and two registrars (12 months); two house officers, for six months, in place of three resident junior house-surgeons, for twelve months. *From January, 1954*, third house officer to be recognized for casualty work and not, as hitherto, for general surgery. Bedford General Hospital, *revision*, period of recognition of two house-surgeons to be reduced from twelve to six months. *From January, 1954*, house-surgeon (casualty department). Dudley Road Hospital, Birmingham, *revision*, senior surgical registrar and surgical registrar, both for twelve months; three house-surgeons, for six months. *From January, 1954*, two casualty officers. Gloucestershire Royal Hospital, *from January, 1954*, casualty officer. *Revision*, period of recognition of first and second house-surgeons to be reduced from twelve to six months. Royal Surrey County Hospital, Guildford, *from January, 1954*, two casualty officers. Edgware General Hospital, *from January, 1954*, two casualty officers. Leicester Royal Infirmary, *revision*, omit one (of five) general house-surgeons. *From January, 1954*, two registrars (casualty and general surgery); senior house officer (casualty department). Bethnal Green Hospital, *from January, 1954*, casualty officer. Miller General Hospital, London, *from January, 1954*, casualty officer. Prince of Wales's General Hospital, London, *from January, 1954*, senior casualty officer. St. Alfege's Hospital, London, *from January, 1954*, casualty officer. St. James' Hospital, Balham, *from January, 1954*, two casualty officers. St. Mary Abbots Hospital, London, *from January, 1954*, casualty officer. Luton and Dunstable Hospital, *redesignation*, senior surgical registrar becomes "registrar" (12 months); senior orthopaedic registrar becomes "orthopaedic registrar," for six months. *From January, 1954*, house officer (casualty). Poole General Hospital, *from January, 1954*, casualty officer. Southlands Hospital, Shoreham-by-Sea, *from January, 1954*, orthopaedic registrar; orthopaedic house-surgeon. *Redesignation*, resident surgical officer now becomes surgical registrar (twelve months); reduction of period of recognition of house-surgeon from twelve to six months. Upton Hospital, Slough, *from January, 1954*, senior house officer (casualty). Leigh Infirmary, Wigan, *from January, 1954*, casualty officer to be recognized for casualty work and not, as hitherto, for general surgery. Royal Albert Edward Infirmary, Wigan, *from January, 1954*, casualty officer to be recognized for casualty work and not, as hitherto, for general surgery.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At a meeting of the Council of the College, held on January 31, with the President, Mr. A. A. Gemmell, in the chair, D. C. A. Bevis, I. Donald, and I. Macdonald were awarded Leverhulme Research Scholarships for 1953.

The following were elected to the Membership of the College: D. M. Brodie, P. Bruce-Lockhart, D. S. Burris, K. G. Cockburn, S. B. Cooper, Janette G. Cowie, H. J. G. De Villiers, H. G. Dixon, Margaret M. Downes, E. M. Edwards, J. R. Elliott, A. H. Foate, G. S. Foster, A. E. Fyfe, G. H. Garfield, J. M. Gate, G. L. Gleeson, L. Goldman, N. G. Gourlay, M. Grant, R. W. Grayburn, J. M. Holmes, G. C. S. Hunter, Valentine M. Husband, Sarah I. Jacob, R. A. Kenihan, K. Khadenga, H. H. Kirk, B. V. Kyle, J. C. McCawley, J. Macpherson, J. S. McVeigh, Jean Murray-Jones, T. J. M. Myles, Ll. M. Norburn, E. M. O'Dwyer, S. Panchalingam, R. M. McK. Pratt, M. J. M. Solomons, W. K. Sutton, T. A. Thompson, R. S. Wurm.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

The following were admitted to the Membership of the College on February 6: G. T. L. Archer, V. T. B. Doyle, T. M. Gregg, Elinor D. U. Powell.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending April 4 (No. 13) and corresponding week 1952.

Figures of *cases* are for the countries shown and London administrative county. Figures of *deaths* and *births* are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1953 Eng. & Wales	1953 Lond.	1953 Scot.	1953 N. Ire.	1953 Eire	1952 Eng. & Wales	1952 Lond.	1952 Scot.	1952 N. Ire.	1952 Eire
Diphtheria	11	1	6	1		29	5	13	0	3
Dysentery	423	60	89	2		592	70	67	1	2
Encephalitis, acute	10	0	0	0		6	0	0	0	
Enteric fever:										
Typhoid	6	0	1	0	4	1	0	0	0	
Paratyphoid	7	1	0	0		12	0	1(B)	0	
Food-poisoning	63	14		1		65	9		33	
Infective enteritis or diarrhoea under 2 years				11	7				7	12
Measles*	21,166	953	401	208	232	6,953	270	588	317	476
Meningococcal infection	43	6	14	0	2	38	4	32	0	3
Ophthalmia neonatorum	36	4	9	0		32	3	16	0	
Pneumonia†	937	72	290	22	6	801	39	400	8	4
Poliomyelitis, acute:										
Paralytic	31	2	0	0		10	1	3	0	3
Non-paralytic	7	1				2	0			
Puerperal fever§	221	27	11	0	1	268	45	17	3	
Scarlet fever	1,403	96	146	40	38	1,403	110	176	18	59
Tuberculosis:										
Respiratory			135	42				170	18	
Non-respiratory			29	2				30	1	
Whooping-cough	2,508	148	273	31	76	3,110	146	262	87	48

DEATHS in Great Towns	1953 Eng. & Wales	1953 Lond.	1953 Scot.	1953 N. Ire.	1953 Eire	1952 Eng. & Wales	1952 Lond.	1952 Scot.	1952 N. Ire.	1952 Eire
Diphtheria	0	0	0		0	0	0		0	0
Dysentery	0	0				1	0		0	
Encephalitis, acute		0			0		1			1
Enteric fever	0	0	0			0	0	0		
Infective enteritis or diarrhoea under 2 years	9	1	1	3	1	11		0	0	1
Influenza	52	7	7	3	1	34	4	16	0	2
Measles		0	0		0		0	2	0	1
Meningococcal infection		2	0				2			
Pneumonia	267	32	25	12	9	282	25		7	4
Poliomyelitis, acute	4	1			0	1	1			0
Scarlet fever		0	0		0		0		0	0
Tuberculosis:										
Respiratory	115	20	15	4	11	119	21	25	3	9
Non-respiratory		3	0	0	2		1	3	0	1
Whooping-cough	7	1	0	0	2	0	0		0	1
Deaths 0–1 year	226	28	26	15	18	257	28	33	9	14
Deaths (excluding stillbirths)	5,587	775	599	144	159	5,294	756	661	101	183
LIVE BIRTHS	7,185	1009	925	231	379	7,766	1188	863	202	381
STILLBIRTHS	199	28	21			199	30	29		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

Vital Statistics

Smallpox in the North Country

Up to noon, April 21, there had been 25 confirmed cases of smallpox, including 6 deaths. Since last week's report there have been 1 death, 1 new case, and 1 suspected case. The patient who died was a man aged 61, probably vaccinated in infancy. The new case was a boy aged 16, unvaccinated. The suspected new case was a woman aged 69, vaccinated in infancy. The boy aged 8 whose death was reported in this column last week is now known to have died from haemorrhagic smallpox.

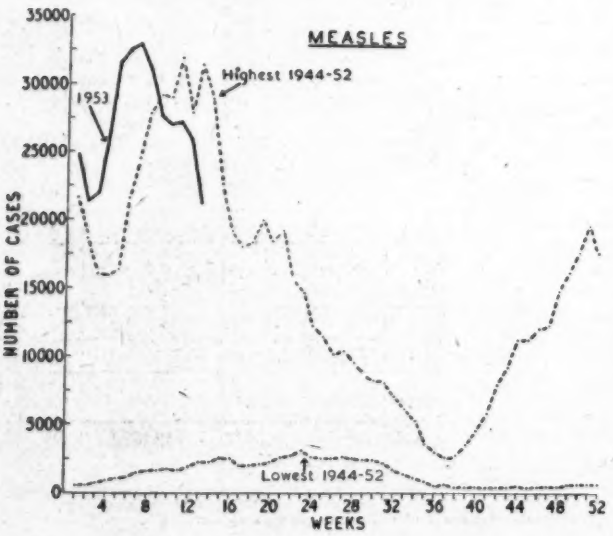
Infectious Diseases in the First Quarter

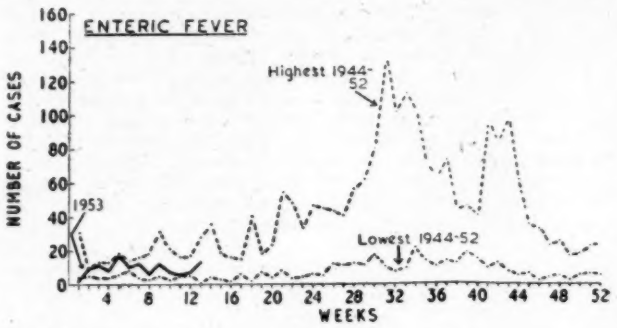
The chief features of the returns of infectious diseases during the first quarter of this year were the trends of measles and diphtheria. The notifications of measles reached the highest level since this disease was made notifiable, 32,890 cases being notified during the seventh week. The notifications of diphtheria reached the lowest level ever recorded, only 11 cases being notified during the thirteenth week. The incidence of scarlet fever and acute pneumonia was relatively high during the quarter. A comparison of the number of notifications for the first quarters of the past five years is as follows :

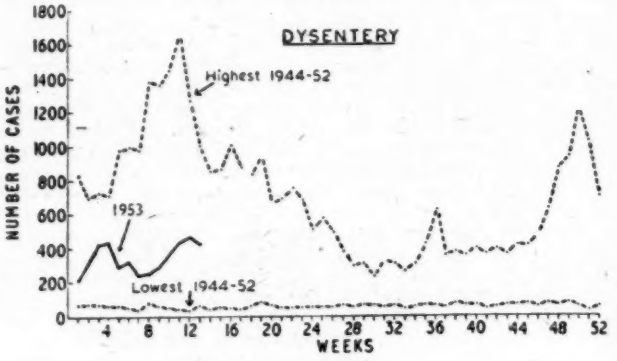
England and Wales	1949	1950	1951	1952	1953
Scarlet fever	16,087	24,802	12,088	18,013	20,550
Diphtheria	1,523	955	572	456	264
Whooping-cough	37,221	23,619	66,865	35,042	34,207
Measles	201,140	54,568	311,709	64,596	350,836
Acute pneumonia	17,147	13,720	26,536	12,960	20,005
Meningococcal infections	474	536	662	562	595
Acute poliomyelitis	245	512	339	238	345
Dysentery	886	3,938	13,995	6,936	4,449
Enteric fevers (typhoid and paratyphoid)	100	154	149	126	123
Great Towns: Influenza deaths			7,448	496	2,995

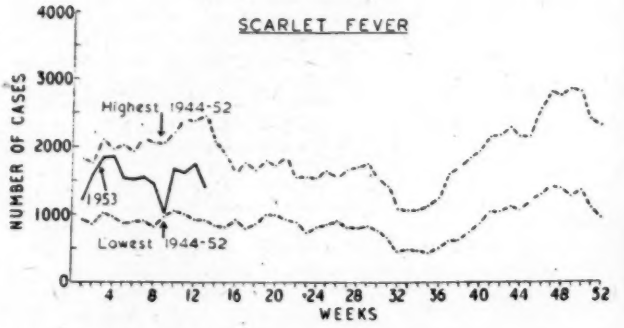
Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944–52 are shown thus - - - - - - -, the figures for 1953 thus ———. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.









Infectious Diseases

Infectious diseases were less prevalent in England and Wales during the week ending April 4. Falls in the number of notifications included 4,625 for measles, from 25,791 to 21,166 ; 694 for whooping-cough, from 3,202 to 2,508 ; and 336 for scarlet fever, from 1,739 to 1,403.

The largest decreases in the incidence of measles were 617 in Yorkshire West Riding, from 1,998 to 1,381 ; 357 in Kent, from 1,149 to 792 ; 336 in Bedfordshire, from 616 to 280 ; 268 in Hertfordshire, from 715 to 447 ; 256 in Middlesex, from 1,098 to 842 ; 235 in Leicestershire, from 614 to 379 ; and 222 in Staffordshire, from 1,272 to 1,050. The largest falls in the number of notifications of whooping-cough were 157 in Lancashire, from 585 to 428 ; 112 in London, from 260 to 148 ; 83 in Yorkshire West Riding, from 251 to 168 ; and 45 in Durham, from 133 to 88. The only large fluctuation in the trends of scarlet fever was a fall of 79 in the number of notifications in Lancashire.

11 cases of diphtheria were notified, 9 fewer than in the preceding week. This total was the smallest ever recorded. The chief feature of the returns of diphtheria was a fall from 10 to 2 in the number of cases notified in Lancashire.

6 cases of typhoid fever were notified, 3 in South Shields C.B., 2 in Wigan C.B., and 1 in Moseley M.B.

38 cases of acute poliomyelitis were notified. These were 11 fewer for paralytic and 3 more for non-paralytic cases than in the preceding week. The largest returns were Yorkshire West Riding 6 (Rotherham C.B. 2), Surrey 5 (Wimbledon M.B. 2), Essex 4 (Brentwood U.D. 2), and Middlesex 4.

The notifications of dysentery fell from 463 to 423. A rise was recorded in Lancashire from 60 to 109, due mainly

to an outbreak in Lancaster M.B. with 31 notifications. The other large returns in this county were Liverpool C.B. 39 and Manchester C.B. 28. The other large centres of infection were London 60 (Bethnal Green 15, Islington 17), Yorkshire West Riding 41 (Leeds C.B. 13, Barnsley C.B. 10), Leicestershire 38 (Leicester C.B. 38), and Middlesex 26 (Edmonton M.B. 16).

52 deaths were attributed to influenza in the great towns, 48 fewer than in the preceding week.

Northern Ireland's Health in 1952

The Registrar-General for Northern Ireland states that the general death rate, the infant mortality rate, and the death rate from tuberculosis for 1952 were the lowest ever recorded. For the first time since records have been maintained no deaths were reported from diphtheria.

The birth rate for 1952 was 20.9 per thousand of the population, as against 20.7 for the previous year. Although this rate is below the average for the five years 1947–51 it is above the 1939 level of 19.5.

The death rate was 10.8 per 1,000 population. This was a decrease of 2.0 as compared with the rate for 1951, but the rate for 1951 was exceptionally high because of the severe epidemic of influenza which occurred early in that year. The death rate from tuberculosis continued to fall, and now stands at 30 per 100,000 of the population. This rate is about one-third of what it was 20 years ago.

During the same period the infant mortality rate fell from 83 deaths per 1,000 live births to 39. For the past three years the maternal mortality rate has remained unchanged at 1.1 per 1,000 live births, this being the lowest rate ever recorded for Northern Ireland. In 1932 this rate was 5.3 deaths per 1,000 births. Only four cases of diphtheria were notified during the year.

Week Ending April 11

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,266, whooping-cough 2,618, diphtheria 19, measles 23,388, acute poliomyelitis 38, dysentery 325, paratyphoid fever 9, and typhoid fever 2.

Medical News

Regius Chair of Medicine, Glasgow.—The Queen has appointed Professor E. J. Wayne to the Regius Chair of Practice of Medicine at Glasgow University in succession to Sir John McNee, who is retiring on October 1. Professor Wayne, who is 50 years of age, is professor of pharmacology and therapeutics at Sheffield University. He is also physician to the Sheffield Royal Infirmary and the Sheffield Hospital for Children.

Association of British Pharmaceutical Industry.—The Minister of Health was the chief speaker at the annual dinner of the Association of British Pharmaceutical Industry on April 15. Discussing the financial problems that concerned the Ministry and the pharmaceutical industry, Mr. Macleod said that the Government, as other Governments had been, was deeply concerned with the size of the drug bill. The total bill that had to be met from Part 4 and Part 2 of the Health Service in England and Wales and Scotland came to about £60 million, of which seven or eight million was paid by the patients. The greatest possible value must be obtained for that large sum, which was a little short of that needed to take sixpence off the income tax. The contribution of the pharmaceutical industry to the export trade was very important, and the industry also had to develop and continue the research which had brought such benefits to mankind. After mentioning the "perfect bill of health" which insulin had been given by the Monopolies Commission on Insulin, Mr. Macleod referred briefly to the efforts of the A.B.P.I. to get the metric system officially adopted, and concluded with a tribute to the pharmaceutical industry's contribution to the National Health Service. In reply the president of the A.B.P.I., Mr. C. L. Saul, said that if the industry made a present of the drugs dispensed by chemists under the N.H.S. the total cost of the Service would still be over £400 million. "The industry," he said, "had to listen to two voices—the Board of Trade and the Ministry of Health." If there were one central body which at the highest level could look at any problems from the domestic and export angle at one and the same time, the industry would give it full co-operation. After Mr. Saul had proposed the health of the guests, Mr. Richard Law, M.P., made a brief reply.

Local Medical Societies.—Recent meetings have included the following: On March 4 there was a joint meeting of the *Liverpool Medical Institution* and the *Manchester Medical Society*, at which Dr. E. N. Chamberlain read a paper on rheumatic carditis and Mr. J. Howell Hughes reviewed the usefulness of gastroscopy. *Manchester Medical Society.*—On February 11 Dr. M. C. G. Israëls dealt with the classification of the reticuloses in his presidential address to the Section of Pathology. On March 10 Mr. Robert Cooke spoke to the Section of Surgery on "Abdominal Exploration and Re-exploration." He stressed the dangers of delaying laparotomy too long in cases of non-penetrating abdominal injury, the need to explore when in doubt—"We talk of paralytic ileus, when we should be operating for mechanical obstruction"—and the value of surgery in advanced malignant disease. On March 11 Professor R. E. Glover, F.R.C.V.S., read a paper to the Section of Pathology on "The Significance of Mutation in Virus Diseases in Animals," using foot-and-mouth disease and influenza for illustration. On March 19 Dr. Maurice Campbell, addressing the Society on "The Selection of Patients for Mitral Valvotomy and the Results," said that the operation should be considered in all patients with mitral stenosis who were progressively disabled. Orthopnoea, cardiac asthma, pulmonary hypertension, and recurrent pulmonary oedema were special indications; active rheumatic carditis, gross mitral regurgitation, and unrelievable congestive heart failure were the main contraindications. On March 23 Dr. E. Howard Kitching read a paper to the Section of General Practice entitled "Some Psychiatric Disorders of Childhood." He discussed behaviour disorders, "tics, tricks, and habits in children," which he said were almost always determined by innate factors and were usually early manifestations of an obsessional character likely to persist throughout life, and juvenile delinquency. *North of England Obstetrical and Gynaecological Society.*—At a meeting in Leeds on March 27 Dr. A. V. G. Bibby described "Two Cases of Ruptured Uterus in Accidental Haemorrhage"; Mr. G. Manley described a case of "Advanced Epithelioma of the Vulva"; Mr. D. C. Racker read a paper on "The Management of Post-maturity"; and Dr. J. C. W. Somerville read a paper on "Cerebral Vascular Accident in Labour."

B.M.S.A. Regional Clinical Conference.—The clinical conference of the midland region of the British Medical Students' Association was held in Oxford from April 15 to 17 under the presidency of the Regius Professor of Medicine, Professor A. D. Gardner. The conference was organized by the Oxford University Medical Society and attended by 80 students from medical schools throughout the country. The programme included lectures, ward rounds, and visits to departments engaged in research.

The May "Family Doctor."—Two articles in the May issue of *Family Doctor*, which appears on Tuesday, aim at relieving the natural fears of those who must face major surgery: "Challenge to a Woman," by Dr. T. Traherne, offers encouragement for the woman whose breast must be amputated, while "I Had My Throat Cut" will hearten those booked for thyroidectomy. Sex education is represented by an illustrated feature, "The Moment of Concep-

tion," which is the first instalment of a new series by Dr. Roger Pilkington, Ph.D., and by Dr. Winifred de Kok's suggestions on how to tell children about the father's part in procreation. On the more strictly medical side there are articles on migraine, vitamin C, and infant feeding. In "Little Thief," Dr. John Brandon sympathetically examines the reasons why children steal and the ways to cure them. A topical note is provided by "First-aid on the Cricket Field" and "Close-up of Science."

International Medical Art Exhibition.—The Royal Netherlands Medical Association is sponsoring an international exhibition of paintings, drawings, and sculpture by doctors, which will be held at The Hague at the time of the Seventh General Assembly of the W.M.A. in September. The exhibition will be run by the Union of Physician-Painters ("Pincettes et Pinceaux") of the Netherlands. Associations of medical artists or individuals who wish to exhibit are invited to write without delay to the Royal Netherlands Medical Association, Keizersgracht 327, Amsterdam C., Netherlands.

National Film Theatre.—The British Film Institute has decided to end the scheme for free associate membership announced in the *Journal* of December 27, 1952 (p. 1429). This is because the response was so great that the National Film Theatre's bona fides as a private theatre has been cast in doubt. Members of the B.M.A. who joined the scheme are being notified by the B.F.I., and are being offered the alternative of paid individual membership.

Blood Donor Record.—Blood donations in England and Wales last year numbered 647,009, the highest total in any year since the 1944 record of 669,000. The total strength of the blood donor panel at the end of the year was 487,660, but 135,000 more donors are still required.

COMING EVENTS

Hastings Lecture, 1953.—Professor F. A. E. Crew, F.R.S., professor of public health and social medicine in the University of Edinburgh, is to give this year's Hastings Lecture of the British Medical Association on May 6 at 6.30 p.m. in the Great Hall of B.M.A. House. His subject is, "Medicine and Social Policy." Mr. Walter Elliott, C.H., F.R.S., will be in the chair. The Hastings Lecture is expressly intended for the lay public, and it is hoped that doctors will bring this function to the notice of lay people who might be able to attend. Admission is free by ticket obtained in advance on application to the Public Relations Department, B.M.A. House, Tavistock Square, London, W.C.1.

The Irish Medical Schools and Graduates Association are holding their annual spring dinner dance at the Rembrandt Hotel on May 7. The president, Dr. W. R. F. Collis (Dublin), will present the Arnott Memorial Medal to Mr. Terence Millin, and will invest Mr. Ian Fraser (Belfast) with the badge of presidency for the coming year. Those Irish graduates interested in this association are invited to write to the honorary secretaries at 149, Harley Street, London, W.1.

Society of Chiropodists.—The 1953 annual convention of the Society of Chiropodists will be held at the Royal Hotel, Woburn Place, London, W.C.1, from May 7 to 9. The convention will include lectures and demonstrations, and will be officially opened by Sir Heneage Ogilvie at 2.30 p.m. on May 7. The annual general meeting of the Society will be held at 10 a.m. on May 9, and the annual dinner will be at the Park Lane Hotel on May 7.

Occupational Therapy Conference.—The Association of Occupational Therapists is holding a conference in the Hoare Memorial Hall, Church House, Westminster, from April 30 to May 2 inclusive. The conference will be opened by the president, Lord Webb-Johnson, at 11 a.m. on April 30, and at 2 p.m. on that day Sir Russell Brain will speak on "A Neurologist Looks at Occupational Therapy." The ordinary general meeting of the association will be held at 2.30 p.m. on May 2.

Contraceptive Technique.—A lecture and demonstration on contraceptive technique will be given by Marie Stopes, Ph.D., at the Mothers' Clinic, 108, Whitfield Street, London, W.1, on May 7 at 2.30 p.m. No fee is charged, but tickets must be obtained in advance, as space is very limited.

Royal Dental Hospital.—The annual clinical "At Home" will be held at the Royal Dental Hospital of London on Saturday, May 9, at 2 p.m.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, April 27

●INSTITUTE OF OPHTHALMOLOGY.—5.30 p.m., Dr. Alan Woods (Baltimore): American Approach to the Cataract Operation.

INSTITUTE OF PSYCHIATRY.—5.30 p.m., lecture-demonstration by Dr. E. Stengel.

●POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. Sheila Sherlock: Portal Hypertension.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. N. R. Barrett: Hiatus Hernia; 6.30 p.m., Mr. Denis Browne: Hypospadias, Epispadias, and Hermaphroditism.

UNIVERSITY COLLEGE.—At Physiology Theatre, 4.45 p.m., Sir Rudolph Peters, F.R.S.: Inhibitors and Intracellular Chemical Dissection.

Tuesday, April 28

DUBLIN UNIVERSITY.—At Physiology Theatre, 4.30 p.m., John Mallet Purser Lecture by Professor A. Brodal (Oslo): Pyramidal Tract in the Light of Recent Anatomical Research.

●INSTITUTE OF OPHTHALMOLOGY.—5.30 p.m., Dr. Alan Woods (Baltimore): Recent Studies on the Pathogenesis of Diabetic Retinopathy.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. A. Dickson Wright: Colostomy; 6.30 p.m., Sir Zachary Cope: Actinomycosis.

SOUTH-WEST LONDON MEDICAL SOCIETY.—At Bolingbroke Hospital, 8.30 p.m., Mr W. A. Hervey: Some Recent Advances in Ear, Nose, and Throat Therapy.

Wednesday, April 29

BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—At Department of Experimental Psychiatry, Medical School, Birmingham, 8 p.m., Professor J. Elkes: Pharmacological Method in Psychiatric Research.

CAMBRIDGE MEDICAL SOCIETY.—At Addenbrooke's Hospital, 8.15 p.m., films: (1) Thrombosis and Embolism; (2) Haemorrhagic Diseases. Discussion to be opened by Dr. J. Marks.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. H. A. Sissons: Growth and Repair in the Pathology of Bone and Muscle.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Sir Clement Price Thomas: Some Aspects of the Surgical Treatment of Pulmonary Tuberculosis; 6.30 p.m., Sir Geoffrey Jefferson, F.R.S.: Stupor—Traumatic and Otherwise.

ROYAL EYE HOSPITAL.—5.30 p.m., Dr. A. A. Guild: Symptomatology and Treatment of Cerebello-pontine Angle Tumours.

UNIVERSITY COLLEGE.—At Physiology Theatre, 4.45 p.m., Professor George Wald (Harvard): Molecular Basis of Vision.

Thursday, April 30

CHADWICK TRUST.—At Walker Art Gallery, Liverpool, 7.30 p.m., Professor S. E. Finer: Public Health—A Comparison Between the Age of Chadwick and Our Own.

LONDON UNIVERSITY.—(1) At Anatomy Lecture Theatre, University College, 5.30 p.m., Professor Wayne Dennis, Ph.D. (New York): Productivity of Scientists. (2) At University College Hospital Medical School, 5.30 p.m., Professor R. Nicolaysen (Oslo): Some Dynamic and Quantitative Aspects of Calcium Metabolism.

NUFFIELD ORTHOPAEDIC CENTRE, Wingfield-Morris Orthopaedic Hospital.—8.30 p.m., Mr. E. W. Somerville: Congenital Dislocation of the Hip.

●POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., two films by Dr. Ian McMillan: (1) Movements of Normal and Pathological Aortic and Mitral Valves; (2) High Speed Cinematography of the Dog's Heart with Simultaneous Pressure Recording.

RENAL ASSOCIATION.—At 41, Portland Place, W., 4.30 p.m., annual general meeting. Dr. H. Wirz (Basle): The Osmotic Work of the Mammalian Kidney.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.30 p.m., Otolaryngology Lecture by Mr. Norman Barrett: Cardiospasm.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND.—6.30 p.m., Mr. R. J. McNeill Love: Gall-bladder and Bile Ducts.

ROYAL EYE HOSPITAL.—5.30 p.m., Miss M. Savory: Conjunctivitis and its Modern Treatment.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Dr. G. S. Dawes: Changes in the Circulation at Birth.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. D. Williams: postgraduate demonstration in neurology.

●WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At London Airport, 7.30 for 8 p.m., dinner meeting. Sir Harold Whittingham: Some Medical Problems of Air Transport.

Friday, May 1

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. M. B. MacKenna: Eczema.

LONDON UNIVERSITY.—At University College Hospital Medical School, 5 p.m., Professor J. Chassar Moir: Use of Radiology in Forecasting the Course of Labour.

●POSTGRADUATE MEDICAL SCHOOL OF LONDON.—12 noon, Professor R. A. McCance, F.R.S.: Renal Function Before and After Birth; 4 p.m., Dr. J. Goodwin: Cardiac Arrhythmias.

ROYAL EYE HOSPITAL.—4.30 p.m., Mr. A. J. Cameron: Virus Diseases of the Eye.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Obstetric and Gynaecological Conference, Tuberculosis in Pregnancy. Speakers, Dr. Raymond Cohen and Dr. W. D. W. Brooks.

Saturday, May 2

MIDLAND TUBERCULOSIS SOCIETY.—At Yardley Green Hospital, clinical meeting.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Toxicity of Detergents

Q.—*What is known about the toxicity of detergents in common domestic use? Are there risks from external contact or ingestion? G. S. Wilson[1] has raised the question of their carcinogenic activity. Is this likely?*

A.—In their concentrated form some of the modern detergents are acutely poisonous when given by mouth to animals. A single human fatality has been described.[2]

They are normally handled in very dilute form for washing and cleaning. Animal experiments have shown that quantities larger than any expected to remain as residues on food from ordinary use can be ingested for long periods without causing toxic effects. There are, however, many different preparations in use, and by no means all have been tested in this way. The possibility that some of these detergents may be carcinogenic is being investigated experimentally at the present time.

Because detergents degrease the skin, are commonly alkaline, and may provoke a sensitization reaction they may and sometimes do provoke a severe type of dermatitis from which recovery is slow. It is not easy to protect against these dangers, but there is some prospect of success from the use of acid-buffered creams.[3]

REFERENCES

[1] *J. roy. san. Inst.*, 1951, 71, 652.
[2] *British Medical Journal*, 1952, 2, 1348.
[3] *Trans. St. John's Hosp. derm. Soc. (Lond.)*, 1952, 31, 7.

Hay-fever Desensitization

Q.—(1) *An adult male suffers from very severe hay-fever every year. In any year he can be prevented completely from having symptoms by a graduated course of 20 injections of the appropriate pollen extract. These injections are quite painful and cause considerable local reaction, especially at the beginning of the course. How can this be prevented?* (2) *Alternatively, if after a full course had been completed the patient was given only maintenance treatment in the form of the maximum dose once every two months, would this be likely to prevent his hay-fever?*

A.—(1) The discomfort attached to starting each new course could be avoided by starting the initial dose at a much weaker strength—approximately one-tenth of the present dose. Excessively large local swellings should be avoided, not only because they are painful, but because they indicate a nearness to a dose which may cause a severe and even dangerous constitutional reaction. If, following an injection, an excessive swelling occurs the dose should be reduced by one-tenth; if a medium swelling occurs the subsequent dose should not be increased but repeated. It would appear that if the present 20 injections were increased to 25 or 30 injections—a more usual scheme—no reactions might occur, and the course would certainly be safer. The maximum dose is correct as the result is satisfactory.

(2) The perennial treatment suggested is a well-accepted method, but the interval between successive maximum doses (or perhaps, preferably, a submaximum dose) should not exceed one month, for a longer interval gives a definite risk of a constitutional reaction. A few patients tend to have constitutional reactions if the interval is more than 10 to 14 days, even on submaximum doses. It is important to remember that solutions of pollen gradually deteriorate in strength, and, when fresh solutions are obtained in the early months of the year, then the dose must be reduced to about 10% of that used with the old extract. The maximum dose should then be built up again by weekly injections. About four weeks before the onset of the hay-fever season the injections should again be given weekly.

Moniliasis Following Treatment with Antibiotics

Q.—*What is the incidence of generalized moniliasis after antibiotic therapy? After which antibiotic is its occurrence most frequent? What are the symptoms, and what is the treatment?*

A.—The exact incidence of moniliasis occurring during the course of treatment with antibiotics is not known. That it is not high is suggested by the fact that the report of a single case still warrants publication. Earlier in this issue two fatal cases are recorded: in the first there was widely disseminated moniliasis and aspergillosis associated with agranulocytosis and antibiotic therapy (p. 918); in the second a monilial peritonitis followed perforation of a duodenal ulcer (p. 919).

The causal organism, the fungus *Candida albicans*, usually behaves as a harmless commensal in the upper respiratory tract, but its potential pathogenicity is shown by its ability to cause thrush, and, much less commonly, to invade the lungs, meninges, endocardium, and the blood stream. The administration of the newer "wide-spectrum" antibiotics (aureomycin, terramycin, and chloramphenicol) in high dosage, and especially when two or more are used simultaneously or in combination with streptomycin or penicillin, can destroy the entire bacterial flora of the respiratory and intestinal tracts; in these circumstances the fungi, which are not sensitive to the drugs, proliferate rapidly and may spread widely. As a rule they cause lesions no more serious than the glossitis and stomatitis which are so familiar and annoying in association with aureomycin therapy, but invasion of the lungs gives rise to a serious illness, with fever, wasting, haemoptysis, and cavitation, which may be mistaken for tuberculosis or, alternatively, may be regarded as an indication for still more energetic chemotherapy. No more specific treatment of the established disease is available than stopping the administration of all antibiotics. This relatively rare complication would be still more rare if it were the rule to give an antibiotic for not more than four days in the absence of a favourable clinical response.

Bathing and Urticaria

Q.—*What investigations and treatment are advised for a man who regularly develops an urticarial eruption almost immediately after bathing, both in fresh and salt water? The patient is keen to continue bathing. Can any likely causes be suggested?*

A.—The treatment of urticaria due to cold water is unsatisfactory. I presume that this reaction to bathing has come on only recently, so it is probable that some new factor in the patient's make-up has become important. Some cases have been cured after search for and removal of septic foci in teeth, tonsils, or elimination of intestinal parasites, and in many cases a very definite psychological stress has appeared to be the cause. If the urticaria is related only to very cold water, repeated baths gradually decreasing the temperature from day to day have been suggested. If none of these causes is present, the only thing to do is to use one of the antihistaminic drugs before bathing takes place. The patient must, of course, be warned of the possible unpleasant side-effects of such drugs, and a drug should be chosen which does not give unpleasant reactions in the particular patient.

Treatment of Congenital Dislocation of the Hip

Q.—*What is the best age for the treatment of congenital dislocation of the hip? What is the prognosis for the development of the acetabulum after reduction? Will any dietary or hormone treatment assist this?*

A.—The best age for the treatment of congenital dislocation is unquestionably as early as possible; the difficulty

of treating the condition early enough arises from the difficulty of diagnosis before the child walks. This is largely because the mother does not notice anything wrong with the hip until that time. However, there is a great deal of evidence that treatment in the early months of life is both simple and satisfactory. Shortening of the leg and alteration of the creases of the thigh are the more obvious signs of this condition, and would warrant *x*-ray examination.

The reformation of the acetabulum after reduction is on the whole satisfactory, and the earlier the reduction the more likely it is to occur. A small percentage of reductions fail to develop a satisfactory roof. Present-day opinion is that these will become subluxated and that a shelf operation is indicated if there is a failure of development of the acetabular roof. No dietary or hormonal treatment is effective.

Oiling Floors and Blankets in Boarding Schools

Q.—*Is the oiling of floors and blankets likely to reduce the incidence of upper respiratory infections in boarding schools?*

A.—Experience of the use of oiling to prevent the dispersal of dust from floors and bedclothes has been largely confined to hospitals and Army barracks. The results obtained there certainly suggested that the treatment often reduced the spread, at least, of infections due to haemolytic streptococci, but except in one instance the reduction was not great. The treatment might well be expected to help also in controlling the spread of similar infections in schools, but it could not of course alone prevent such spread. The technique of oiling bedclothes[1] and floors[2] has been described in this *Journal*.

REFERENCES

1 *British Medical Journal*, 1944, 1, 615.
2 Ibid., 1944, 1, 616.

Immobilization in Spinal Tuberculosis

Q.—*What is the best way of immobilizing cases of spinal tuberculosis?*

A.—Cases of spinal tuberculosis can be immobilized either in a plaster bed or on a spinal frame of the Robert Jones type. The latter is a more efficient method, and such frames can be obtained from most appliance-makers. Immobilization is usually required for not less than two years.

NOTES AND COMMENTS

Dangers of Aluminium Welding.—Dr. H. G. TAYLOR, D.Sc., M.I.E.E., F.Inst.P. (Director of Research, British Welding Research Association), and Dr. E. G. WEST, Ph.D., F.I.M. (Technical Director, The Aluminium Development Association), write: Your issue of March 14 (p. 631) contained an answer to a request for information on the health of welders of aluminium. Experience with this process now extends over some 50 years, so that its health hazards are well understood, and we should be obliged if you would publish our comments on the reply referred to above. The principal risks are the same as in the welding of other metals—for instance, electric shock and injuries to the eyes and skin as indicated in *The Health of Welders*, by A. T. Doig and L. N. Duguid.[1] Reporting a clinical survey of 247 industrial welders engaged on steel welding, these authors state that the abnormal physical signs sometimes found indicate "a mild form of bronchial irritation and are not associated with evidence of pulmonary fibrosis or of impaired exercise tolerance." Although some abnormal *x*-ray appearances were observed, these were believed to be due to the deposition of fume, which lies inertly in the lungs and disappears when exposure to fume ceases. The *x*-ray picture was stated, therefore, to be of little significance in itself, which conforms with the suggestions made in your journal about *x*-ray pictures taken after 10 years of aluminium welding. Hunter, Milton, Perry, and Thompson[2] found no evidence that the dust of aluminium or of aluminium oxide produced any disease of the trachea, bronchi, or lungs of 92 men engaged in grinding aluminium-alloy aircraft propellers.

An analysis given in the published reply may perhaps give a misleading impression of the nature of fumes produced in welding aluminium. Fluorine and chlorine in the free, uncombined condition are certainly never present, although there might conceivably be fluorides and chlorides from the fluxes or electrode coatings used. The modern inert-gas shielded welding arc, however, requires no flux or coating, so that such compounds will be absent. In our view it is highly doubtful whether there are any grave risks associated with the production of ozone or oxides of nitrogen in welding, but good ventilation is essential when working in a confined space if for no other reason than to help dissipate the heat generated. Lastly, we must correct the statement that lead is present in aluminium. No commercial aluminium alloy contains more than 0.05% lead, and the alloys which are welded contain much less than this.

REFERENCES

1 *The Health of Welders*, 1951. Factory Department, Ministry of Labour and National Service.
2 *Brit. J. industr. Med.*, 1944, 1, 159.

OUR EXPERT writes: No doubt aluminium welding was tried about 50 years ago, but my information is that a really satisfactory method of doing it was developed about 1938 and that it has only been done on an appreciable scale during the last eight years. The health risks of the welding of steel are well known, but this was not the subject of the question. The remarks by Doig on the clinical and *x*-ray features of welders apply only to the welding of steel, and he was able to find only one reference to aluminium welding[1] in the medical literature reviewed.

There is no space to review the many articles on the effects of aluminium on the lungs, but the fact is that some writers say that it damages the lungs, while others say that it is harmless. In quoting analyses of fumes, one can only give the results as stated by the investigators, and admittedly such information might be misleading if it is not interpreted correctly by the reader. It should be pointed out, however, that the soluble fluorides as well as free fluorine are toxic. In correcting the statement that lead might be present in aluminium alloys, the writers admit that my statement is correct, by saying that no commercial alloy contains more than 0.05% lead. It is true that Thrysin, Gerhardsson, and Forssman[2] found only small amounts of lead in the fume from aluminium welding. But they did find some, and it would be better from the health point of view if there were no lead at all. It is a matter of opinion whether or not "there are any grave risks associated with the production of ozone or oxides of nitrogen in welding." Medical opinion would certainly classify such a risk as grave when many deaths have been reported as a result of welding in confined spaces. The risk is greater with oxyacetylene than with electric arc welding, and less when the shielded arcs are used. Thrysin *et al.*[3] also point out that the amount of nitrogen oxides developed depends primarily on the length of the arc, on the voltage, and also on the amperage used. The heat generated constitutes, by comparison, a minor risk.

REFERENCES

1 Renander, A., *Acta radiol., Stockh.*, 1937, 18, 688.
2 *Arch. industr. Hyg.*, 1952, 6, 381.

Spinach.—Dr. H. LEHMANN (Tunbridge Wells) writes: Spinach is not richer in iron than other plants. If anything it is poorer in that respect than most vegetables (Hill, R., and Lehmann, H., *Biochem. J.*, 1941, 35, 1190). The widespread misconception is probably based on the fact that its peculiar preparation for the table involves a degree of concentration not applied to any other greens. Cooked spinach corresponds to about ten times its volume as a raw vegetable. One lb. (0.45 kg.) of fresh spinach occupies, after cooking, a volume of 12 fl. oz. (336 ml.); this is three times less than the space taken up by the equivalent amount of cabbage (1¼ pints—994 ml.).

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